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California Regional Water Quality Control Board

Central Valley Region

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Gray Davis
Governor

Mr. Steven Overman
Equilon Enterprises LLC
P.O. Box 1476
Bakersfield, CA 93302

9 January 2001

REVISED MONITORING AND REPORTING PROGRAM, EQUILON ENTERPRISES LLC, KERN COUNTY

We received a letter from Equilon Enterprises LLC dated 7 November 2000 requesting several revisions to Monitoring and Reporting Program (MRP) No. 91-102. MRP No. 91-102 is part of Waste Discharge Requirements (WDRs) Order No. 91-102, regulating wastewater discharge from refining operations to underground injection wells. The 7 November 2000 letter contained a copy of a 21 July 1998 letter sent to the Board from Equilon, containing its original request for modifications to MRP No. 91-102. The requested modifications to MRP No. 91-102 included eliminating the requirement to maintain a minimum annular pressure of 100 psig. Equilon also requested that MRP No 91-102 be modified so the total annular fluid volume change requiring Board notification be increased from 2 to 45 gallons. The requested changes are to requirements that are not critical to ensuring the mechanical integrity of the injection wells. Therefore, the cost of continuing them is not justified and the requested modifications are reasonable.

MRP No. 91-102 does not currently require the discharge to be monitored for methyl tert-butyl ether (MTBE). Equilon has conducted monitoring for MTBE and included the results of the analyses in monthly monitoring reports. Monitoring indicates that MTBE has been present in the effluent.

Pursuant to California Water Code (CWC) Section 13267, the Board is issuing revised Monitoring and Reporting Program No. 91-102. This revised MRP incorporates modifications requested by Equilon and requires weekly monitoring of effluent for MTBE.

If you have any questions regarding these matters, please call Geoffrey Anderson at (559) 445-5919.

GARY M. CARLTON
Executive Officer

Enclosures: Revised Monitoring and Reporting Program 91-102

cc: George Robin, USEPA Region IX, San Francisco
Burton Ellison, California Division of Oil, Gas, and Geothermal Resources, Bakersfield
Joe Selgrath, Petrotech, Bakersfield
Jennifer Costanza, Baker and Hostetler, Los Angeles

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

REVISED MONITORING AND REPORTING PROGRAM NO. 91-102

FOR
EQUILON ENTERPRISES, LLC
WASTEWATER INJECTION WELLS
KERN COUNTY

EFFLUENT MONITORING

The Discharger shall retain records concerning the nature and composition of all injected fluids until five years after the completion of plugging and abandonment procedures. The Discharger shall continue to retain such records after the retention period specified, unless it delivers the records to the Executive Officer or obtains written approval from the Executive Officer to discard the records. Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;

b. the individual(s) who performed the sampling or measurements;

c. a precise description of both sampling methodology and the handling (custody) of samples;

d. the date(s) analyses were performed;

e. the names of individual(s) who performed the analyses;

f. the analytical techniques or methods used; and

g. the results of such analyses.

Effluent samples shall be collected at a well mixed waste location downstream from the last connection through which wastes can be admitted into the wells. Effluent samples shall be representative of the volume and mixed compositional nature of the discharge. Table I shall constitute the effluent monitoring program.

Table I - Effluent monitoring program.

Constituent	Units	Type of Sample	Sampling Frequency
Specific Electrical Conductance	umhos/cm	Grab	Monthly
pH		Grab	Monthly
Total Dissolved Solids	mg/l	Grab	Weekly
Arsenic	mg/l	Grab	Monthly
Barium	mg/l	Grab	Monthly
Boron	mg/l	Grab	Monthly
Cadmium	mg/l	Grab	Monthly
Calcium	mg/l	Grab	Monthly
Chloride	mg/l	Grab	Monthly
Chromium (total)	mg/l	Grab	Monthly
Copper	mg/l	Grab	Monthly
Fluoride	mg/l	Grab	Monthly
Lead	mg/l	Grab	Monthly
Magnesium	mg/l	Grab	Monthly
Mercury	mg/l	Grab	Monthly
Potassium	mg/l	Grab	Monthly
Selenium	mg/l	Grab	Monthly
Silver	mg/l	Grab	Monthly
Sodium	mg/l	Grab	Monthly
Sulfate	mg/l	Grab	Monthly
Vanadium	mg/l	Grab	Monthly
Zinc	mg/l	Grab	Monthly
Benzene	ug/l	Grab	Weekly
Ethylbenzene	ug/l	Grab	Weekly
Methylcyclohexane	ug/l	Grab	Monthly
Methyl Tert-butyl Ether	ug/l	Grab	Weekly
Phenols (total)	ug/l	Grab	Weekly
Toluene	ug/l	Grab	Weekly
Xylenes	ug/l	Grab	Weekly

The discharge shall not exceed the following concentrations as measured by 30-day flow weighted analysis:

Constituent	Monthly Concentration
TDS	2,500 mg/l
Benzene	500 ug/l
Ethylbenzeze	1,000 ug/l
Total Phenols	100 mg/l
Toluene	3,000 ug/l
Xylenes	3,000 ug/l
Total Chromium	2.0 mg/l

DISPOSAL WELL MONITORING

1. The Discharger shall, within 30 days after perforation or reperforation, perform a casing evaluation log (i.e., a pipe analysis log), spinner survey, temperature survey, and a radioactive tracer survey to confirm that the injected wastewater is being confined to the authorized zone of injection.

2. A 24-hour pressure fall-off test, or alternative procedure approved by the Executive Officer, annular pressure test, and injection profile surveys, which include a spinner, temperature, and a radioactive tracer survey to demonstrate the mechanical integrity of each well, shall be made on an annual basis. A casing evaluation log shall be run at least once every fifth year. Mechanical integrity shall also be demonstrated any time the tubing is removed from the well, the packer is reset, or a loss of mechanical integrity becomes evident during operation. The Discharger shall notify the Regional Board and the Division of Oil and Gas at least seven days prior to such demonstration.

3. If the Discharger or the Board finds that the well fails to demonstrate mechanical integrity during a test, or a loss of mechanical integrity becomes evident during operation, or the pressure fall-off test indicates zone overpressuring, the operation shall be halted immediately and shall not be resumed until the Regional Board gives approval to recommence injection. The Discharger shall notify the Board in accordance with said reporting procedures.

4. The annular space between the tubing and long-string casing shall be filled with a corrosion inhibiting annulus fluid. The results of an analysis indicating the concentration of the constituents in the proposed fluid formulation shall be submitted to the Executive Officer for review. Formulation shall be consistent with accepted engineering practice and the guidelines and requirements that the U. S. Environmental Protection Agency has specified for disposal wells in California.

   The Discharger shall notify the Board when a total annular fluid volume change of 45 gallons occurs at Standard Temperature and Pressure (STP). Adjustment of the annular space volume is considered a physical alteration and is subject to reporting requirements. The total annular fluid volume range and minimum annular pressure must be maintained unless a demonstration for suitable alternative values is submitted by the Discharger and has been approved in writing by the Executive Officer.

   The change in volume and the amount of fluid added to the annular space shall be recorded weekly and reported monthly.

5. The cumulative flow in mgd shall be recorded daily.

6. Continuous monitoring devices shall be used to monitor injection pressure, flow rate and volume, and the annular pressure and fluid volume between the tubing and the long-string casing above the packer.

REPORTING

The Discharger shall submit short, accurate monthly reports to the Executive Officer by the **1st day of the second month** following sampling. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the data, the constituents, and the concentrations are readily discernable.

In the first monthly report after a new well or new perforations are operational, the Discharger shall report to the Regional Board the results of the following:

a. Mechanical integrity tests.

b. Other tests required by this document.

c. Any well workover.

The monitoring data shall be evaluated by the Discharger and a statement as to its compliance with this Order shall be submitted.

A written submission shall also be provided within **five** days of the time the Discharger becomes aware of any instance of noncompliance. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time for correction if it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

The results of **any** monitoring conducted more frequently than required in the Monitoring and Reporting Program shall be reported to the Board.

The Discharger shall submit a report to the Board by **1 February** of each year. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.

Ordered by: _____
GARY M. CARLTON, Executive Officer

1/9/01
(Date)

REVISED 9 January 2001

DSJ:fmc:4/26/91

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 91-102

WASTE DISCHARGE REQUIREMENTS
FOR
TEXACO REFINING AND MARKETING, INCORPORATED
WASTEWATER INJECTION WELLS
KERN COUNTY

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

1. Texaco Refining and Marketing Incorporated (hereafter Discharger) submitted a Report of Waste Discharge on 7 July 1989 requesting a revision of existing waste discharge requirements. A technical report on the project was submitted on 11 July 1989. Additional information was submitted to complete the technical report on 16 February 1990 and 5 July 1990. The property (Assessor's Parcel Nos. 332-260-08 and 332-04-101) is owned by the Discharger.

2. The Discharger proposes to dispose of refinery wastewater in four existing deep injection wells and three proposed deep injection wells.

3. The Discharger proposes to discharge a maximum of 1.05 mgd of wastewater from the Discharger's refinery.

4. This Order is being issued in compliance with Division 7 of the Water Code, Sections 13000 through 13999 (Porter-Cologne Water Quality Control Act).

5. The site is within the boundaries of the Fruitvale Oil Field, on the northwest side of Bakersfield, California, within the Tulare Lake Basin of the San Joaquin Valley. The Discharger currently operates 4 injection wells, and proposes to construct and operate three additional injection wells. The existing and proposed injection wells will be at the Discharger's Bakersfield refinery (hereafter Plant) in Sections 23 and 27, T29S, R27E, MDB&M, as shown in Attachment A, which is part of this Order. Wastewater generated by the Plant is currently disposed of through the four existing on-site injection wells, designated W. I. No. 1, Red Ribbon W.D. No. 1, Red Ribbon No. 7, and Red Ribbon No. 8.

6. The Board adopted Order No. 81-065 on 22 May 1981, prescribing waste discharge requirements for injection well W.I. No. 1.

7. The Board adopted Order No. 86-238 on 12 December 1986, prescribing waste discharge requirements for injection well Red Ribbon W.D. No. 1.

8. Injection wells Red Ribbon No. 7 and Red Ribbon No. 8 are not currently subject to any Orders issued by the Board.

9. Topography in the area is flat. Activities in the area are associated with oil field production, refining, and limited industrial operations.

10. The facility lies outside the 100-year flood boundary area according to the Federal Insurance Administrator's "Flood Hazard Boundary Map".

11. The sedimentary section in the Fruitvale Oil Field ranges in thickness from 8,500 to 11,570 feet of Eocene to Recent marine and alluvial sediments, which overlie a basement complex of schist. The different formations within these sediments form the common limb of a faulted homocline that dips gently towards the southwest. This homocline is part of the deep, northwest trending structural basin known as the San Joaquin Basin.

12. According to information submitted by the Discharger, there are no significant faults which are active or potentially active on or immediately adjacent to the proposed injection site.

13. One minor subsurface, high angle fault, with approximately 20 feet of offset, is shown in prior publications to exist adjacent to the area underlying the injection site approximately 500 feet northeast of injection well W.I. No. 1. The presence of this fault is inferred from the distribution of oil in the subsurface sediments. The fault is not observed in wells which cross the inferred fault-plane.

14. The Discharger submitted information demonstrating that the entrapment of the oil is probably due to the pinching-out of discontinuous sand bodies in the subsurface. A past convention within the oil industry was to indicate the updip limit of oil accumulation by a fault, irregardless of the actual mechanism of oil entrapment. The publications which first illustrated this possible fault were published over 25 years ago and appear to follow this prior convention. The presence of a fault at this location thus appears to be a misconception based on negative evidence, which resulted in placing the fault on earlier maps as a matter of convenience to explain the occurrence of oil accumulations.

15. According to information submitted by the Discharger, there are presently no wells within the radial area of influence of waste migration that are producing from or injecting into the equivalent injection disposal intervals.

INJECTION WASTE STREAM

16. The waste stream consists of process waters generated from refinery units at the Plant operated by the Discharger and processed through the wastewater treatment plant. The refinery process units generating wastewater which is discharged to the wastewater treatment unit include: water softeners, boiler blowdown, cooling tower blowdown, sulphur recovery and tail gas treating units, delayed coking unit, coke handling operations, tank farm water drains, sour water stripping units, desulphurization units, flare knockouts, surface runoff, truck and tank car loading racks, crude unit (desalters and miscellaneous streams), groundwater and soil remediation projects, produced waters from the Fruitvale Oil Field, hydrocrackers, catalytic reformers, sour gas stripping units, exchanger cleaning, hydrogen plant, and other miscellaneous units associated with refinery operations.

17. Typical daily discharge is expected to be approximately 0.630 mgd with a maximum of 1.050 mgd. Waste streams will be piped to a wastewater treatment unit. Treated and filtered wastewater will be contained in storage tanks at the facility, then piped to one of the injection wells for disposal. The injection facility has a design service life of 20 years.

INJECTION ZONE

18. Disposal of waste through the four existing injection wells and three proposed injection wells will be into the marine, Pliocene and Miocene age, basal Etchegoin, Chanac, and Santa Margarita formations. Injection is between an approximate subsurface interval of 3,500 feet and 5,500 feet. The actual injection interval will be determined based on the results of data obtained during the drilling of the wells.

19. Portions of the basal Etchegoin, Chanac, and Santa Margarita formations are currently hydrocarbon producing in the Fruitvale Oil Field within one mile of the injection wells.

20. The basal portion of the Etchegoin formation, which averages 200 feet thick, consists of interbedded Pliocene age coarse-grained, micaceous sands and gray, micaceous shales. The Pliocene-Miocene age Chanac formation unconformably underlies the Etchegoin formation, averages 1,100 feet in thickness, and consists of fine- to coarse-grained sands with interbedded siltstones and claystones. The upper Miocene age Santa Margarita formation averages 1,000 feet in thickness and consists of fine- to coarse-grained sands, with shales comprising the lower part of the unit. Below the Santa Margarita formation exists the Fruitvale Shale, approximately 1,500 feet thick.

21. The basal Etchegoin, Chanac, and Santa Margarita formations are currently utilized for injection of Class II wastewaters in the Fruitvale Oil Field as defined in the Federal Underground Injection Control (UIC) program and administered by the California Division of Oil and Gas. These formations have been administratively classified as exempt aquifers for the purpose of Class II injection (oilfield produced wastewaters) within the Fruitvale Oil Field in accordance with UIC criteria. Class II injection within the Fruitvale Oil Field has been a continuing practice since June 1958.

22. Analysis of waters from the proposed injection zone indicates it is of poor quality with a total dissolved solids concentration greater than 3,000 mg/l. The proposed injection zone is not an underground source of drinking water in accordance with State of California criteria contained in Regional Board Resolution No. 89-098 (see Finding Nos. 24-28).

23. Table I is a comparison between the water quality of the waste stream and the formations of the injection zone. The Discharger figures represent analyses obtained from samples taken between 30 June 1981 and 3 April 1990.

AQUIFER BENEFICIAL USE EVALUATION

24. The Regional Board on 26 May 1989 adopted Resolution No. 89-098, which defines waters which are considered Municipal and Domestic (MUN) sources of water.

25. Resolution No. 89-098 states:

> "All surface and ground waters of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards with the exception of:
>
> 1. <u>Surface and ground waters where</u>:
>
> a. The total dissolved solids (TDS) exceed 3,000 mg/l (5,000 uS/cm, electrical conductivity) and it is not reasonably expected by Regional Boards to supply a public water system, or
>
> b. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or

Table I - Wastewater and formation water constituent levels.

Constituent mg/l; unless noted	TRMI Wastewater	Etchegoin Fm.	Chanac Fm.	Santa Margarita Fm.	Title 22 Standard
Inorganic Constituents					
TDS	1909	3515	4815	5783	500.0
Conductivity (umhos/cm)	2651	1930		8900	900
pH	8.5	7.0	7.1	7.7	
Arsenic	0.008	-	-	0.175	0.05
Barium	0.128	0.3	0.7	0.55	1.0
Boron	1.2	3.3	3.0	7.0	
Cadmium	<0.005	-	-	<0.01	0.01
Calcium	68.0	282	129	160	
Chloride	479	1597	679	2625	250
Chromium (tot.)	0.02	-	-	0.44	
Copper	<0.01	-	-	2.3	1.00
Fluoride	0.56	-	-	<0.1	4.0
Iron	-	0.97	1.2	42	0.35
Lead	<0.005	-	-	1.32	0.05
Magnesium	4.7	118	54	49	
Manganese	-	-	-	1.5	0.05
Mercury (ug/l)	0.97	-	-	0.002	0.002
Potassium	8.6	47	76.5	24	
Selenium	0.482	-	-	<0.35	0.01
Sodium	450	740	660	1800	
Sulfate	530	12	7.0	15.0	250
Sulfite	-	-	-	191	
Vanadium	<0.05	-	-	<0.35	
Zinc	0.686	-	-	3.06	5.0
Organic Constituents					
Benzene (ug/l)	490	-	-	6,431	1.0
Ethylbenzene (ug/l)		-	-	5,993	680.0
Phenol	0.87	-	-	5.9	
Toluene (ug/l)	7,300	-	-	5,947	100.0
Xylene (ug/l)		-	-	5,280	1,750.0
2,4-Dimethylphenol (ug/l)	235	-	-	411	

c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day."

and

"3. Ground waters:

a. Where the aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations (CFR), Section 146.4, for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3;".

26. The following information, supplied by the Discharger, addresses the application of the criteria discussed in Finding No. 25:

a. The concentration of total dissolved solids within waters of the receiving zone is greater than 3,000 mg/l and is not reasonably expected to supply a public water system. The concentration of total dissolved solids (TDS) and chloride found within waters of the basal Etchegoin, Chanac, and Santa Margarita formations exceeds the Secondary Drinking Water Standards of Title 22, California Code of Regulations by six to ten times (see Finding No. 23).

b. Portions of the basal Etchegoin, Chanac, and Santa Margarita formations produce hydrocarbons in commercial quantities in the Fruitvale Oil Field within one mile of the injection wells.

c. Chemical analysis of produced waters from hydrocarbon producing wells (on and adjacent to the site) within the Santa Margarita formation, indicate that naturally occurring benzene, ethylbenzene, and xylene concentrations exceed Title 22 Standards for drinking water (see Finding No. 23).

d. The receiving aquifer is not currently serving as a source of drinking water, or an agricultural, municipal or industrial water supply.

e. The injection zone is not considered a future USDW based upon its stratigraphic location, poor water quality, and the availability of higher quality water on or near the surface. Waters within the basal Etchegoin, Chanac, and Santa Margarita formations are not

suitable for drinking water or for irrigation without treatment. The amortized cost of retrieving and treating the injection zone water is reported to be approximately $1,300 per acre-foot. Currently, low salinity water from an on-site well at the Plant is available for $30 per acre-foot.

f. Waters of the basal Etchegoin, Chanac, and Santa Margarita formations have been determined by the California Division of Oil and Gas (CDOG) not to be an underground source of drinking water, pursuant to 40 CFR, Part 146.4, for the purposes of Class II underground injection. Produced water injection into Class II injection wells regulated by the CDOG into the basal Etchegoin, Chanac, and Santa Margarita formations of the Fruitvale Oil Field has been a continuing practice since June 1958. This aquifer exemption extends a distance of one-quarter mile outside the administrative boundary of the Fruitvale Oil Field.

27. Based upon information submitted, the formation waters of the injection zone are not suitable, or potentially suitable, for municipal or domestic water supply in accordance with items 1a, 1b, and 3a in Finding No. 25, and they do not have any demonstrated current or future beneficial uses.

28. On _____, the Regional Board adopted Resolution No. _____, a determination that the injection zone is not a source, or potential source, of municipal or domestic supply per Regional Board Resolution No. 89-098.

INJECTION WELL DESIGN AND OPERATION

29. Design of the proposed injection wells is similar to existing injection wells currently operated by the Discharger and other nonhazardous dischargers in the area. These wells have been injecting concentrated waste solutions for over ten years. This information attests to the integrity of the well design as substantiated by annual mechanical integrity tests.

30. To prevent upward and lateral migration of wastewater, the annular space outside the long string casing will be cemented from the bottom of the wells to the ground surface. Surface casing will be cemented from a minimum depth of 600 feet to the surface and a minimum of 40 feet of conductor casing will be used for the wells, as shown in Attachment B, which is a part of this Order.

31. If the injection flow rate falls off, due to the clogging of interstitial pores, the Discharger anticipates the use of typical stimulation fluids, including bactericide, HCl, HF, and toluene with surfactant to increase the permeability of the receiving formation, in accordance with currently accepted reservoir engineering practices.

32. After 20 years of continuous injection at a rate that equals the maximum daily discharge, the waste front within the injection zone, where the injected liquids displace the formation waters, was calculated to extend a radial distance of 526 to 1,247 feet from the well bore. The dispersion front, where the injected liquids commingle with the formation waters, was calculated to extend radially outward 618 to 1,387 feet from the well bore.

33. Current formation pressure in the basal Etchegoin formation is 1,050 psi. Following 20 years of continuous wastewater disposal, the formation pressure will be 1,078 psi at the well bore and 1,060 psi at a radial distance of 2,000 feet from the well bore, representing hydraulic increases of 64 feet and 23 feet respectively. Twenty years after cessation of injection, the formation pressures are expected to decrease to 1,051 psi, both adjacent to, and a radial distance of 2,000 feet from, the well bore, resulting in a net hydraulic head increase of 2.3 feet in the basal Etchegoin formation.

34. Current formation pressure in the Chanac formation is 1,054 psi. Following 20 years of continuous wastewater disposal, the formation pressure will be 1,082 psi at the well bore and 1,064 psi at a radial distance of 2,000 feet from the well bore, representing hydraulic increases of 64 feet and 23 feet respectively. Twenty years after cessation of injection, the formation pressures are expected to decrease to 1,055 psi, both adjacent to, and a radial distance of 2,000 feet from, the well bore, resulting in a net hydraulic head increase of 2.3 feet in the Chanac formation.

35. Current formation pressure in the Santa Margarita formation is 1,685 psi. Following 20 years of continuous wastewater disposal, the formation pressure will be 1,762 psi at the well bore and 1,712 psi at a radial distance of 2,000 feet from the well bore, representing hydraulic increases of 177 feet and 62 feet respectively. Twenty years after cessation of injection, the formation pressures are expected to decrease to 1,687 psi, both adjacent to, and a radial distance of 2,000 feet from, the well bore, resulting in a net hydraulic head increase of 4.6 feet in the Santa Margarita formation.

36. The aforementioned changes in hydraulic head will be insufficient to cause migration of injected wastewater into overlying useable ground waters in the absence of confinement. The existing and proposed injection zones are overlain by adequate thicknesses of low permeability clay layers which should confine the wastewaters to the intended injection zone and preclude contamination of the useable ground waters. All of the existing and proposed injection wells are constructed so as to preclude the migration of wastewaters around the well bores into overlying ground water zones. No adverse effects upon the shallow aquifers are anticipated as a result of wastewater injection.

OTHER CONSIDERATIONS

37. The CDOG has been notified of the Discharger's intent to drill the additional injection wells. CDOG will act in a consulting capacity to the Board in overseeing the proper construction and testing of the wells. Also, since the Plant is within the administrative boundary of an oil field, the Discharger must also apply to the CDOG for a permit to drill the proposed injection wells.

OTHER LEGAL REFERENCES

38. The Board on 25 July 1975 adopted the *Water Quality Control Plan for the Tulare Lake Basin (5D)* which contains water quality objectives. These requirements are consistent with that Plan.

39. These requirements are proposed to conform with the intent of the Underground Injection Control regulations administered by the U.S. Environmental Protection Agency.

40. The Board, acting as lead agency, made an environmental analysis, pursuant to the California Environmental Quality Act (CEQA) of Title 14, California Code of Regulations, and formulated a negative declaration. The project, as proposed, will not have a significant effect on the environment.

41. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge.

42. The Board, in a public hearing, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that Order No. 81-065 and Order No. 86-238 be rescinded and that Texaco Refining and Marketing, Inc., 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. The discharge of waste to surface water, surface water drainage courses, or usable ground water is prohibited.

2. The injection of any waste types not specified or constituents in excess of those specified within the context of these requirements is prohibited.

3. The injection of any hazardous waste is prohibited. This includes any waste constituents contained herein which may subsequently be listed by the U. S. Environmental Protection Agency or the California Department of Health Services as hazardous.

4. Injection between the outermost casing and the well bore is prohibited.

B. **Discharge Specifications:**

1. Neither the treatment nor discharge shall cause a pollution or nuisance as defined by the California Water Code, Section 13050. In the event of a pollution or nuisance, the Discharger shall take all responsible steps to minimize or correct any adverse impact on the environment resulting from noncompliance with the requirements.

2. The maximum daily discharge shall not exceed 1,050,000 gallons (1.05 mgd).

3. The discharge shall not exceed the following concentrations as measured by 30-day flow weighted analysis:

Constituent	Monthly Concentration
TDS	2,500 mg/l
Benzene	500 ug/l

Constituent	Monthly Concentration
Ethylbenzene	1,000 ug/l
Total Phenols	100 mg/l
Toluene	3,000 ug/l
Xylenes	3,000 ug/l
Total Chromium	2.0 mg/l

4. The Discharger shall maintain casing and cement to prevent the movement of fluids into or between aquifers other than in the injection zone. The casing, tubing, liner, and cement used in the construction of the wells shall be maintained for the life of the well. Notification of change in construction The Discharger shall give advance notice to the Regional Board for Executive Officer approval of any planned changes in the construction of the injection wells. The following specifications apply to the injection wells:

Conductor casing:	40 feet of new 20 inch, steel
Surface casing:	600 feet of new 11-3/4 inch, grade J-55, 54#, steel casing, or 750 feet of new 13-3/8 inch, grade H-40, 48#, steel casing
Long string casing:	4,400 feet of new 6-5/8 inch, grade J-55, 24#, steel casing extending downward from the surface, or 5,900 feet of new 8-5/8 inch, grade K-55, 32#, steel casing extending downward from the surface
Tubing:	New 2-7/8 inch O.D., 6.5#, J-55, EU coupling from surface to approximately 3350 feet, or new 4-1/2 inch O.D., 12.75#, J-55, EU coupling from surface to approximately 4,650 feet

Centralizers:	Will be installed on the long string casing at the rate of one per casing joint from the base of the casing to 200 feet above the injection zone, and one per every three casing joints from 200 feet above the injection zone to the base of the surface casing, and one every 250 feet inside the surface casing.

The Executive Officer may approve an alternative casing and completion program which is equivalent to, or better than, the above proposed specified program.

5. Injection must take place in the basal Etchegoin and Chanac zones through 2-7/8 inch O.D., 6.5#, J-55 tubing with a 2-7/8 inch x 6-5/8 inch hookwall retrievable packer, or equivalent, to be set in 6-5/8 inch, 24#, J-55 casing at 3,500 feet. Injection must take place in the Santa Margarita zone through 4-1/2 inch O.D., 12.75#, J-55 tubing with a 4-1/2 inch x 8-5/8 inch hookwall retrievable packer set at 4,650 feet. The tubing and packer shall be maintained in a manner which is compatible with said requirements to prevent the movement of fluids into or between other underground sources of drinking water. The tubing and packer shall be corrosion resistant and be of sufficient strength to resist wellbore pressure developed during the life of the well.

6. The minimum depth of injection shall be the top of the basal portion of the Etchegoin formation (200 feet above the base of the Etchegoin formation) at an approximate depth of 3,500 feet. The maximum depth of injection shall be the base of the Santa Margarita formation at an approximate depth of 5,500 feet.

7. Representative continuous cores of the confining zone and injection zone shall be taken during the drilling of the proposed injection wells. The cores shall be analyzed to document the competency of the confining zone and the compatibility between the injection zone and injection fluid. Standard core descriptions shall include information on the porosity, permeability and capillary pressures for the confining zone (in both the horizontal and vertical directions) and the injection zone.

8. Following the drilling and completion of each injection well, technical reports are to be submitted by the Discharger to the Board for approval prior to the initiation of injection. The reports need to include the information, methods, results, evaluations, and/or actions as indicated below:

   a. An evaluation of the mechanical integrity of the well.

   b. Cement bond logs.

   c. All geological and geophysical well logs, well data, core data (demonstrating the thickness and competency of the confining zone), capillary pressure data, and well histories with accompanying interpretation.

   d. A formation fluid sample shall be analyzed for general minerals, trace elements, and priority pollutants. A waste stream analysis for general minerals, trace elements, and priority pollutants is to be performed within 30 days of initiation of injection.

   e. The Executive Officer, or his qualified representative, has inspected or otherwise reviewed the new injection well construction and finds it is in compliance with the conditions of said requirements.

9. Injection wastewater shall be restricted to that produced by the Discharger from its refinery, oil production operations, and ground water remediation efforts at the Plant in the Fruitvale Oil Field and identified in Finding No. 16.

10. Injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure that the pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures in the injection zone. In no case shall injection pressure initiate fractures in the confining zone. The maximum injection pressure, as measured at the top of the perforated injection interval and at the wellhead, shall not exceed eighty percent (80%) of the pressure required to initiate fractures in either the injection zone or the confining layer during operation of the well. Prior to initiation of injection, the Discharger shall submit to the Executive Officer, for approval, all calculations and supporting data which will demonstrate the maximum allowable injection pressures (80% of fracture pressure), at the wellhead and at the top of the perforated injection interval, for the interval into which the discharge will be injected.

11. Construction and injection pressures shall be such that no passageways are developed which will permit the movement of wastes to a usable aquifer or to the surface.

12. An adequate spill management plan shall be submitted to the Executive Officer within 90 days of the adoption of these requirements.

13. Waste holding facilities shall be protected from inundation or washout which could occur as a result of a 100-year frequency, 24-hour duration storm.

14. Wastewater treatment, holding, distribution, and injection facilities shall be constructed of materials that are compatible with the waste and that shall prevent percolation or infiltration of waste to surface or ground water.

15. The pressure rating of all piping, valves, and appurtenant facilities shall meet or exceed the maximum anticipated injection pressure. This equipment must be maintained in a safe and leak-free condition.

C. **Provisions:**

1. The Discharger is allowed to engage in underground injection only within the guidelines of these requirements.

2. The Regional Board may, for cause or upon request from the Discharger, modify, revoke and reissue, or terminate these requirements.

3. The Regional Board may also modify, revoke and reissue, or terminate these requirements in accordance with any amendments to the California Water Code if the amendments have applicability to the waste discharge requirements.

4. The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of said requirements. Proper operation and maintenance includes effective performance, adequate laboratory and process controls, including appropriate quality assurance procedures. Any remedial work on active, idle, or abandoned wells in the project area, necessary because of the disposal project, shall be the responsibility of the Discharger.

5. The Discharger shall furnish to the Executive Officer, within a time specified, any information which the Executive Officer may request to determine whether cause exists for modifying, revoking and reissuing, or terminating these requirements, or to determine compliance with said requirements. The Discharger shall also furnish to the Executive Officer, upon request, copies of records required to be kept by these said requirements.

6. The Discharger shall allow the Executive Officer, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

   a. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of said requirements;

   b. have access to, and copy at reasonable times, any records that are kept under the conditions of these said requirements;

   c. inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under these said requirements; and

   d. sample or monitor at reasonable times for the purposes of assuring requirement compliance on the disposal site.

7. The Discharger shall retain records and all monitoring information including all calibration and maintenance records and all original chart recordings for continuous monitoring instrumentation and copies of all reports required by said document for a period of at least five years from the date of the sample, measurement or report.

8. Forty-five days prior to abandonment of any disposal well, the Discharger shall file a technical report with the Executive Officer describing the methods and controls to be used for closing the well. The proposed abandonment procedure shall be approved by the Executive Officer prior to implementation. Well abandonment shall be accomplished under the supervision of a registered geologist, a registered petroleum engineer, or the Department of Conservation, Division of Oil and Gas. Within 60 days after plugging a well, the Discharger shall submit a report to the Regional Board. The report shall be certified as accurate by the person who supervised the plugging operation and shall consist of either:

a. A statement that the well was plugged in accordance with the plan previously submitted to the Board; or

b. if the actual plugging differed from the approved plan, a statement defining the actual plugging, and why the Board should approve such a deviation from the approved plan. Deviation from the previously approved plan may be cause for the Board to require the Discharger to replug the well.

9. The Discharger is required to maintain financial responsibility and resources to close, plug, and abandon the underground injection operation in a manner consistent with Federal UIC regulations (contained in 40 CFR, Section 146.10) and regulations of the California Division of Oil and Gas. Evidence of the financial responsibility mechanism shall be provided to the Board within 90 days following adoption of these requirements, and if required, shall be updated periodically upon request of the Board.

10. The injection wells must have and maintain mechanical integrity.

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

12. The Discharger shall comply with the attached Monitoring and Reporting Program No. 91-102, which is hereby incorporated into this Order.

13. The Discharger shall comply with the applicable Standard Provisions and Reporting Requirements, dated 1 March 1991, which are a part of this Order.

14. The Discharger shall report promptly to the Board any material change or proposed change in the character, location, volume, or rate of the discharge.

15. The owner or operator must notify the Board by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 business days after the commencement of such proceedings. A guarantor or a corporate guarantee must make such a notification if he is named as debtor, as required under the terms of the guarantee.

16. In the event of any change in control or ownership of land, mineral rights, or waste discharge 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 forwarded to the Board.

17. A copy of this order shall be kept at the facility so as to be available at all times to operating personnel.

18. This Order does not constitute a license or permit, neither does it authorize the commission of any act resulting in injury to the property of another, nor does it protect the Discharger from his liabilities under federal, state, or local laws.

I, WILLIAM H. CROOKS, 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 26 April 1991.

WILLIAM H. CROOKS, Executive Officer

DSJ:fmc:4/26/91

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 91-102

FOR
TEXACO REFINING AND MARKETING, INCORPORATED
WASTEWATER INJECTION WELLS
KERN COUNTY

EFFLUENT MONITORING

The Discharger shall retain records concerning the nature and composition of all injected fluids until five years after the completion of plugging and abandonment procedures. The Discharger shall continue to retain such records after the retention period specified, unless he delivers the records to the Executive Officer or obtains written approval from the Executive Officer to discard the records. Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;

b. the individual(s) who performed the sampling or measurements;

c. a precise description of both sampling methodology and the handling (custody) of samples;

d. the date(s) analyses were performed;

e. the names of individual(s) who performed the analyses;

f. the analytical techniques or methods used; and

g. the results of such analyses.

Effluent samples shall be collected at a well mixed waste location downstream from the last connection through which wastes can be admitted into the wells. Effluent samples shall be representative of the volume and mixed compositional nature of the discharge. Initial samples are to be obtained within 30 days after the initiation of injection, and reported no later than 60 days following initiation of injection. Table I shall constitute the effluent monitoring program.

Table I - Effluent monitoring program.

Constituent	Units	Type of Sample	Sampling Frequency
Specific Electrical Conductance	umhos/cm	Grab	Monthly
pH		Grab	Monthly
Total Dissolved Solids	mg/l	Grab	Weekly
Arsenic	mg/l	Grab	Monthly
Barium	mg/l	Grab	Monthly
Boron	mg/l	Grab	Monthly
Cadmium	mg/l	Grab	Monthly
Calcium	mg/l	Grab	Monthly
Chloride	mg/l	Grab	Monthly
Chromium (total)	mg/l	Grab	Monthly
Copper	mg/l	Grab	Monthly
Fluoride	mg/l	Grab	Monthly
Lead	mg/l	Grab	Monthly
Magnesium	mg/l	Grab	Monthly
Mercury	mg/l	Grab	Monthly
Potassium	mg/l	Grab	Monthly
Selenium	mg/l	Grab	Monthly
Silver	mg/l	Grab	Monthly
Sodium	mg/l	Grab	Monthly
Sulfate	mg/l	Grab	Monthly
Vanadium	mg/l	Grab	Monthly
Zinc	mg/l	Grab	Monthly
Benzene	ug/l	Grab	Weekly
Ethylbenzene	ug/l	Grab	Weekly
Methylcyclohexane	ug/l	Grab	Monthly
Phenols (total)	ug/l	Grab	Weekly
Toluene	ug/l	Grab	Weekly
Xylenes	ug/l	Grab	Weekly

The discharge shall not exceed the following concentrations as measured by 30-day flow weighted analysis:

Constituent	Monthly Concentration
TDS	2,500 mg/l
Benzene	500 ug/l
Ethylbenzeze	1,000 ug/l
Total Phenols	100 mg/l
Toluene	3,000 ug/l
Xylenes	3,000 ug/l
Total Chromium	2.0 mg/l

DISPOSAL WELL MONITORING

1. The Discharger shall, within 30 days after perforation or reperforation, perform a casing evaluation log (i.e., a pipe analysis log), spinner survey, temperature survey, and a radioactive tracer survey to confirm that the injected wastewater is being confined to the authorized zone of injection.

2. A 24-hour pressure fall-off test, or alternative procedure approved by the Executive Officer, annular pressure test, and injection profile surveys, which include a spinner, temperature, and a radioactive tracer survey to demonstrate the mechanical integrity of each well, shall be made on an annual basis. A casing evaluation log shall be run at least once every fifth year. Mechanical integrity shall also be demonstrated any time the tubing is removed from the well, the packer is reset, or a loss of mechanical integrity becomes evident during operation. The Discharger shall notify the Regional Board and the Division of Oil and Gas at least seven days prior to such demonstration.

3. If the Discharger or the Board finds that the well fails to demonstrate mechanical integrity during a test, or a loss of mechanical integrity becomes evident during operation, or the pressure fall-off test indicates zone overpressuring, the operation shall be halted immediately and shall not be resumed until the Regional Board gives approval to recommence injection. The Discharger shall notify the Board in accordance with said reporting procedures.

4. The annular space between the tubing and long-string casing shall be filled with a corrosion inhibiting annulus fluid. The results of an analysis indicating the concentration of the constituents in the proposed fluid formulation shall be submitted to the Executive Officer for review. Formulation shall be consistent with accepted engineering practice and the guidelines and requirements that the U. S. Environmental Protection Agency has specified for disposal wells in California.

   A minimum annular pressure of 100 psig measured at the wellhead shall be maintained at all times.

   The Discharger shall notify the Board when a total annular fluid volume change of two gallons occurs at Standard Temperature and Pressure (STP). Adjustment of the annular space volume is considered a physical alteration and is subject to reporting requirements. The total annular fluid volume range and minimum annular pressure must be maintained unless a demonstration for suitable alternative values is submitted by the Discharger and has been approved in writing by the Executive Officer.

   The change in volume and the amount of fluid added to the annular space shall be recorded weekly and reported monthly.

   Six months following adoption of these requirements, the Discharger shall submit a report or an evaluation of the results of the annulus fluid volume monitoring system. The report shall include a recommendation for a reportable change necessary for review by the Executive Officer.

5. The cumulative flow in mgd shall be recorded daily.

6. Continuous monitoring devices shall be used to monitor injection pressure, flow rate and volume, and the annular pressure and fluid volume between the tubing and the long-string casing above the packer.

REPORTING

The Discharger shall submit short, accurate monthly reports to the Executive Officer by the **end of the month following sampling.** In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the data, the constituents, and the concentrations are readily discernable.

In the first monthly report after a new well or new perforations are operational, the Discharger shall report to the Regional Board the results of the following:

a. Mechanical integrity tests.

b. Other tests required by this document.

c. Any well workover.

The monitoring data shall be evaluated by the Discharger and a statement as to its compliance with this Order shall be submitted.

A written submission shall also be provided within five days of the time the Discharger becomes aware of any instance of noncompliance. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time for correction if it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

The results of any monitoring conducted more frequently than required in the Monitoring and Reporting Program shall be reported to the Board.

The Discharger shall submit a report to the Board by 30 January of each year. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.

Ordered by William H. Crooks
WILLIAM H. CROOKS, Executive Officer

26 April 1991
(Date)

DSJ:fmc:4/26/91

INFORMATION SHEET

TEXACO REFINING AND MARKETING
INCORPORATED,WASTEWATER INJECTION WELLS
KERN COUNTY

Texaco Refining and Marketing, Inc., (TRMI) proposes to dispose of refinery processed wastewaters by underground injection within the Fruitvale Oil Field. These requirements will regulate seven injection wells.

The wastewater will be piped to the Discharger's treatment facility prior to being piped to the injection wells. The wastewater is currently discharged to four existing injection wells operated by the Discharger at the refinery. Two of the existing injection wells are currently regulated by two separate Orders issued by the Regional Board. The waste stream has been declared nonhazardous pursuant to procedures established by the Department of Health Services.

A maximum of 1.05 mgd of wastewater may eventually be discharged through the injection wells. Typical daily discharge is expected to be approximately 0.630 mgd. The wells will inject wastewater into the Pliocene and Miocene age sands of the basal Etchegoin, Chanac, and Santa Margarita formations. The injection zones are between 3,500 and 5,500 feet beneath the surface. Portions of the basal Etchegoin, Chanac, and Santa Margarita formations are currently hydrocarbon producing in the Fruitvale Oil Field within one-mile of the injection wells. The basal portion of the Etchegoin formation, which averages 200 feet thick, consists of interbedded Pliocene age coarse-grained, micaceous sands and gray, micaceous shales. The Pliocene-Miocene age Chanac formation unconformably underlies the Etchegoin formation, averages 1,100 feet in thickness, and consists of fine- to coarse-grained sands with interbedded siltstones and claystones. The upper Miocene age Santa Margarita formation averages 1,000 feet in thickness and consists of fine- to coarse-grained sands, with shales comprising the lower part of the unit. Below the Santa Margarita formation exists the Fruitvale Shale, approximately 1,500 feet thick.

After 20 years of continuous injection at a rate that equals the maximum daily discharge, the waste front within the injection zone, where the injected liquids displace the formation waters, was calculated to extend a radial distance of 526 to 1,247 feet from the well bore. The dispersion front, where the injected liquids commingle with the formation waters, was calculated to extend radially outward 618 to 1,387 feet from the well bore.

Current formation pressure in the basal Etchegoin formation is 1,050 psi. Following 20 years of continuous wastewater disposal, the formation pressure will be 1,078 psi at the well bore and 1,060 psi at a radial distance of 2,000 feet from the well bore, representing hydraulic increases of 64 feet and 23 feet respectively. Twenty years after cessation of injection, the formation pressures are expected to decrease to 1,051 psi, both adjacent to, and a radial distance of 2,000 feet from, the well bore, resulting in a net hydraulic head increase of 2.3 feet in the basal Etchegoin formation.

Current formation pressure in the Chanac formation is 1,054 psi. Following 20 years of continuous wastewater disposal, the formation pressure will be 1,082 psi at the well bore and 1,064 psi at a radial distance of 2,000 feet from the well bore, representing hydraulic increases of 64 feet and 23 feet respectively.

Twenty years after cessation of injection, the formation pressures are expected to decrease to 1,055 psi, both adjacent to, and a radial distance of 2,000 feet from, the well bore, resulting in a net hydraulic head increase of 2.3 feet in the Chanac formation.

Current formation pressure in the Santa Margarita formation is 1,685 psi. Following 20 years of continuous wastewater disposal, the formation pressure will be 1,762 psi at the well bore and 1,712 psi at a radial distance of 2,000 feet from the well bore, representing hydraulic increases of 177 feet and 62 feet respectively. Twenty years after cessation of injection, the formation pressures are expected to decrease to 1,687 psi, both adjacent to, and a radial distance of 2,000 feet from, the well bore, resulting in a net hydraulic head increase of 4.6 feet in the Santa Margarita formation.

The aforementioned changes in hydraulic head will be insufficient to cause migration of injected wastewater into overlying useable ground waters in the absence of confinement. The existing and proposed injection zones are overlain by adequate thicknesses of low permeability clay layers which should confine the wastewaters to the intended injection zone and preclude contamination of the useable ground waters. All of the existing and proposed injection wells are constructed so as to preclude the migration of wastewaters around the well bores into overlying ground water zones. No adverse affects upon the shallow aquifers are anticipated as a result of wastewater injection.

In the Fruitvale Oil Field, the Basal Etchegoin, Chanac, and Santa Margarita formations are currently used as disposal zones for oil field produced water.

The injection wells will be constructed with a long-string casing cemented from the surface to the total depth of the well, 600-750 feet of surface casing cemented to the surface, and 40 feet of conductor casing. A well packer and injection tubing will be landed immediately above the injection zone. The annular space between the tubing and the long-string casing will be filled with a corrosion inhibiting annulus fluid. An analysis of the fluid will be submitted for review and approval. The annular fluid pressure shall be maintained at a minimum of 100 psi at all times. A change in the total annular fluid volume in excess of two gallons will be required to be reported to the Board. The California Division of Oil and Gas concurs with the proposed well construction.

The basal Etchegoin, Chanac, and Santa Margarita formations contain water of poor quality. In accordance with Regional Board Resolution No. 89-098, all surface and ground waters are considered to be suitable, or potentially suitable, for municipal or domestic water supply with the exception of those aquifers which meet certain specified criteria. Table I contains water quality analyses submitted by TRMI characterizing the waste stream and formation waters.

INFORMATION SHEET

TEXACO REFINING AND MARKETING INCORPORATED, WASTEWATER INJECTION WELLS, KERN COUNTY

Table I - Wastewater and formation water constituent levels.

Constituent mg/l; unless noted	TRMI Wastewater	Etchegoin Fm.	Chanac Fm.	Santa Margarita Fm.	Title 22 Standard
Inorganic Constituents					
TDS	1909	3515	4815	5783	500.0
Conductivity (umhos/cm)	2651	1930		8900	900
pH	8.5	7.0	7.1	7.7	
Arsenic	0.008	-	-	0.175	0.05
Barium	0.128	0.3	0.7	0.55	1.0
Boron	1.2	3.3	3.0	7.0	
Cadmium	<0.005	-	-	<0.01	0.01
Calcium	68.0	282	129	160	
Chloride	479	1597	679	2625	250
Chromium (tot.)	0.02	-	-	0.44	
Copper	<0.01	-	-	2.3	1.00
Fluoride	0.56	-	-	<0.1	4.0
Iron	-	0.97	1.2	42	0.35
Lead	<0.005	-	-	1.32	0.05
Magnesium	4.7	118	54	49	
Manganese	-	-	-	1.5	0.05
Mercury (ug/l)	0.97	-	-	0.002	0.002
Potassium	8.6	47	76.5	24	
Selenium	0.482	-	-	<0.35	0.01
Sodium	450	740	660	1800	
Sulfate	530	12	7.0	15.0	250
Sulfite	-	-	-	191	
Vanadium	<0.05	-	-	<0.35	
Zinc	0.686	-	-	3.06	5.0
Organic Constituents					
Benzene (ug/l)	490	-	-	6,431	1.0
Ethylbenzene (ug/l)		-	-	5,993	680.0
Phenol	0.87	-	-	5.9	
Toluene (ug/l)	7,300	-	-	5,947	100.0
Xylene (ug/l)		-	-	5,280	1,750.0
2,4-Dimethylphenol (ug/l)	235	-	-	411	

The analyses in Table I indicate that, based on the average concentrations, wastewaters are dominated by Chloride, Sodium, and Sulfate. The waste stream exceeds the Drinking Water Standards for TDS, EC, Chloride, Sulfate, and Selenium.

Water quality analyses from the proposed injection zone indicates that it is of poor quality, with a total dissolved solids concentration greater than 3,000 mg/l. The proposed injection zone is not an underground source of drinking water in accordance with State of California criteria contained in Regional Board Resolution No. 89-098.

Chemical analyses of produced waters from hydrocarbon producing wells in the Santa Margarita formation in the Fruitvale Oil Field indicates that benzene, ethylbenzene, and xylenes exceed Title 22 Standards for drinking water.

TRMI has addressed the application of the criteria contained in Resolution No. 89-098. The following information was supplied by TRMI:

1. The TDS concentration of waters within the injection zone is greater than 3,000 mg/l and are not reasonably expected to supply a public water system.

2. The concentration of TDS and chloride found within the waters of the basal Etchegoin, Chanac, and Santa Margarita formations exceeds the Secondary Drinking Water Standards of Title 22 by six to ten times.

3. Waters within the Santa Margarita formation contain naturally occurring concentrations of benzene, ehtylbenzene, and xylenes which exceed State Action Levels.

4. Portions of the basal Etchegoin, Chanac, and Santa Margarita formations produce hydrocarbons in commercial quantities in the Fruitvale Oil Field within one-mile of the injection wells.

5. The receiving aquifer is not currently serving as a source of drinking water, or an agricultural, municipal, or industrial water supply. The high Boron concentration of the waters in the injection zone make the water unsuitable for agricultural purposes without prior treatment.

6. The basal Etchegoin, Chanac, and Santa Margarita formations within the administrative boundary of the Fruitvale Oil Field, and a distance of one-quarter mile outside the administrative boundary of the Fruitvale Oil Field, have been exempted from the Underground Source of Drinking Water classification pursuant to Federal regulations for the purpose of Class II injection of oil field produced wastewaters. Class II injection within the Fruitvale Oil Field is regulated by the California Division of Oil and Gas, and has been a continuing practice since June 1958.

Based upon the submitted information, the formation waters of the injection zone are not suitable, or potentially suitable, for municipal or domestic water supply in accordance with the criteria contained in Resolution No. 89-098. Also, the formation waters do not have any demonstrated current or future beneficial uses.

The proposed Order includes a monitoring and reporting program to insure that the wastewaters remain in the intended zone and that the concentration of certain constituents are not exceeded. Injection and annular pressures will be monitored continuously. Volumetric changes of the annular fluid will also be monitored. Within 30 days of completion of an injection well and prior to initiation of injection, formation fluids and the waste stream shall be analyzed for general minerals, trace elements, and priority pollutants. Wastewater analyses for general minerals, trace elements, and organic constituents will be performed monthly. Within 30 days after injection is initiated, and annually thereafter, the Discharger shall perform a spinner survey, temperature survey, a radioactive tracer survey, annular pressure test, and a casing evaluation log to evaluate the mechanical integrity of the wells.

The Board, acting as lead agency, made an environmental analysis and formulated a negative declaration. The project, as proposed, will not have a significant effect on the environment.

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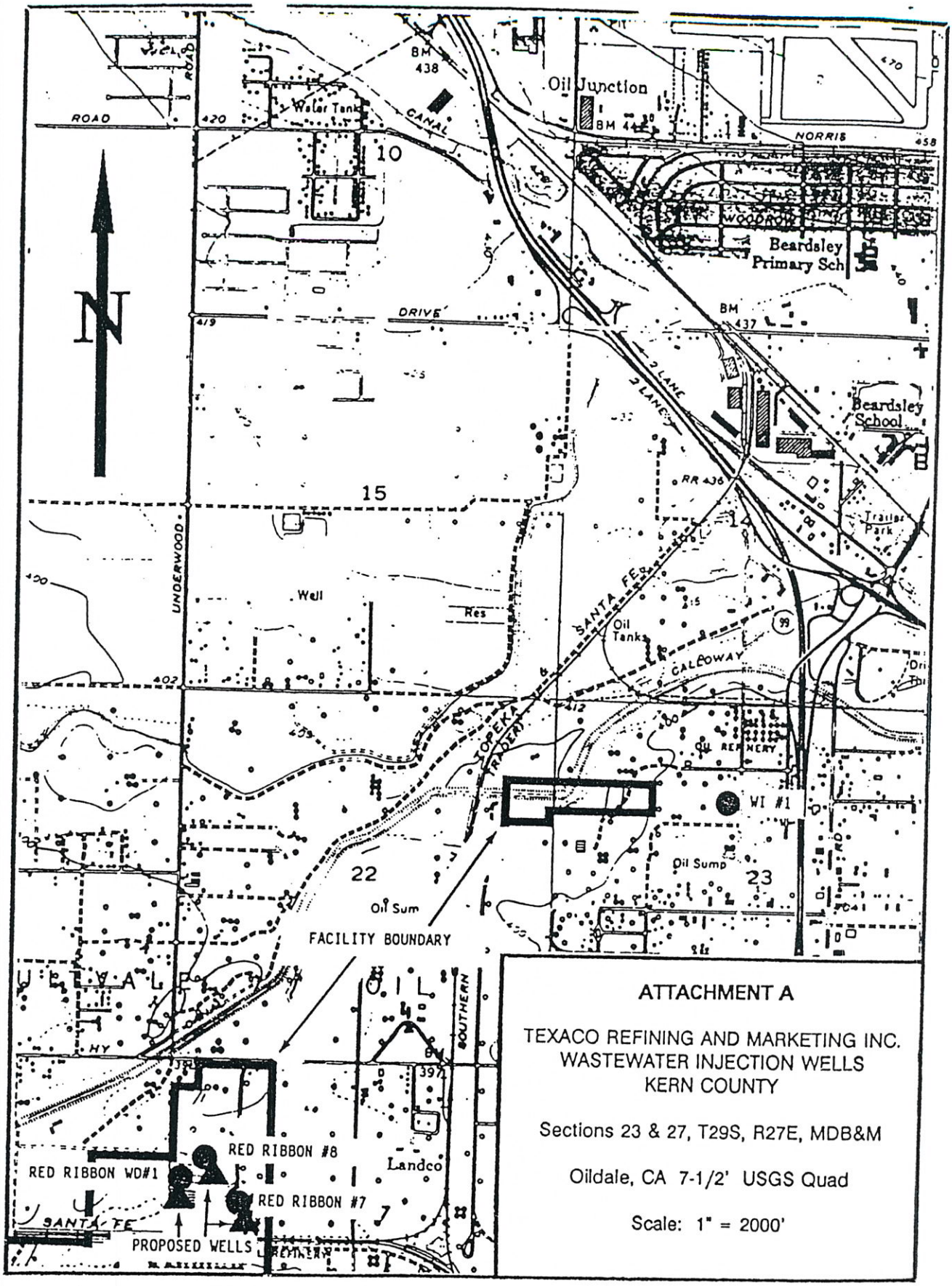


ATTACHMENT A

TEXACO REFINING AND MARKETING INC.
WASTEWATER INJECTION WELLS
KERN COUNTY

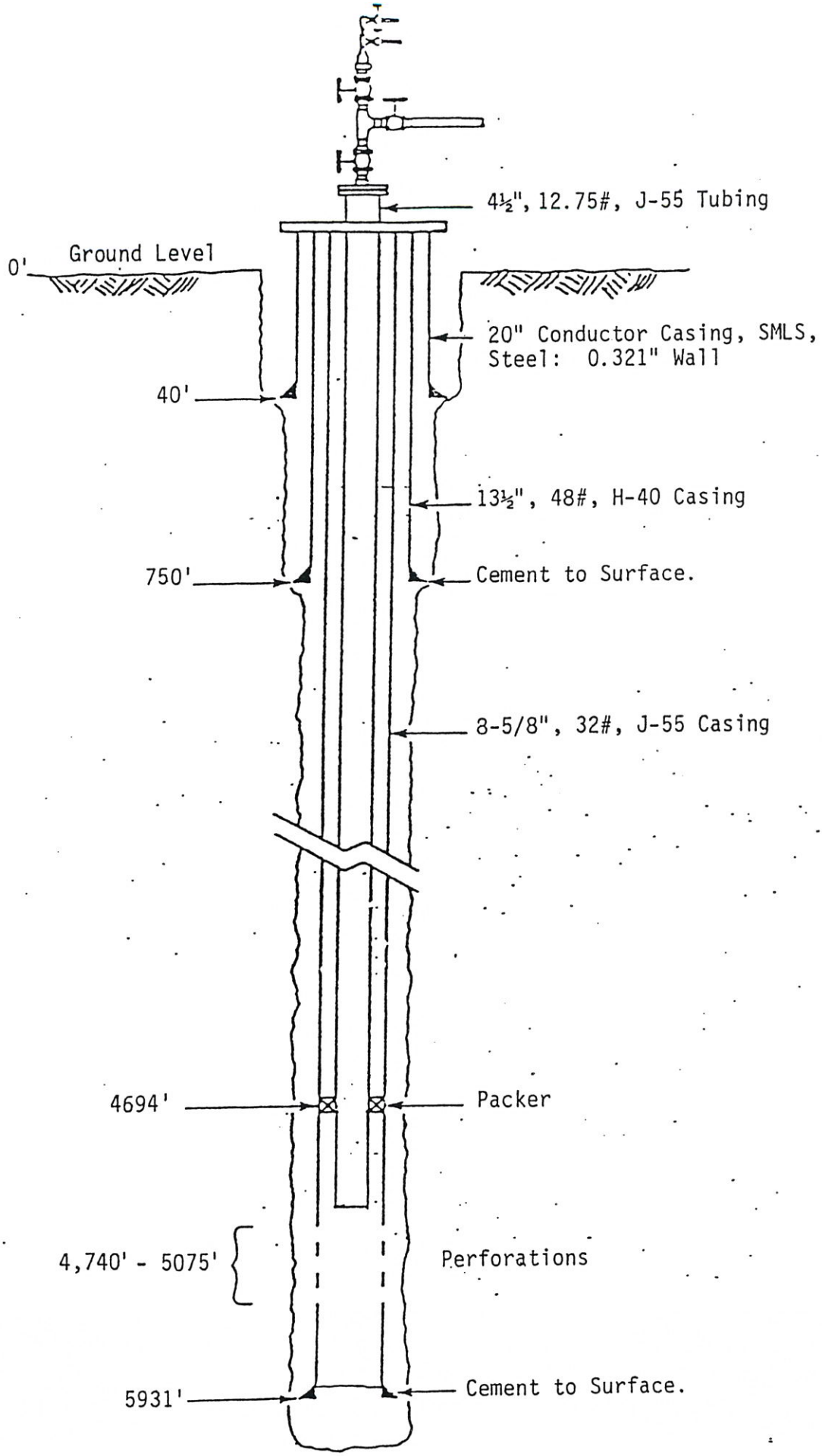
Sections 23 & 27, T29S, R27E, MDB&M

Oildale, CA 7-1/2' USGS Quad

Scale: 1" = 2000'

RED RIBBON WD NO. 1

ATTACHMENT B



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS FOR WASTE DISCHARGE REQUIREMENTS

1 March 1991

A. General Provisions:

1. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, or protect the discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.

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

3. 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 failure to disclose fully all relevant facts;

   c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge;

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

4. Before making a material change in the character, location, or volume of discharge, the discharger shall file a new Report of Waste Discharge with the Regional Board. A material change includes, but is not limited to, the following:

   a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements

   b. A significant change in disposal method, location or volume, e.g., change from land disposal to land treatment.

   c. The addition of a major industrial, municipal or domestic waste discharge facility.

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

A. **General Provisions (continued)**

5. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Board. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.

6. The discharger shall take all reasonable steps to minimize any adverse impact to the waters of the state resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance.

7. The discharger shall maintain in good working order and operate as efficiently as possible any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

8. The discharger shall permit representatives of the Regional Board (hereafter Board) and the State Water Resources Control Board, upon presentation of credentials, to:

   a. Enter premises where wastes are treated, stored, or disposed of and facilities in which any records are kept,

   b. Copy any records required to be kept under terms and conditions of this Order,

   c. Inspect at reasonable hours, monitoring equipment required by this Order, and

   d. Sample, photograph and video tape any discharge, waste, waste management unit or monitoring device.

9. For any electrically operated equipment at the site, the failure of which could cause loss of control or containment of waste materials, or violation of this Order, the discharger shall employ safeguards to prevent loss of control over wastes. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means.

10. The fact that it would have been necessary to halt or reduce the permitted activity in Order to maintain compliance with this Order shall not be a defense for the discharger's violations of the Order.

11. Neither the treatment nor the discharge shall create a condition of nuisance or pollution as defined by the California Water Code, Section 13050.

A. General Provisions (continued)

12. The discharge shall remain within the designated disposal area at all times.

B. General Reporting Requirements

1. In the event the discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the discharger shall notify the Board by telephone at (209) 445-5116 as soon as it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing within two weeks. The written notification shall state the nature, time and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.

2. The discharger shall have a plan for preventing and controlling accidental discharges, and for minimizing the effect of such events.

   This plan shall:

   a. Identify the possible sources of accidental loss or leakage of wastes from each waste management, treatment, or disposal facility.

   b. Evaluate the effectiveness of present waste management/treatment units and operational procedures, and identify needed changes or contingency plans.

   c. Predict the effectiveness of the proposed changes in waste management/treatment facilities and procedures and provide an implementation schedule containing interim and final dates when changes will be implemented.

   The Board, after review of the plan, may establish conditions that it deems necessary to control leakages and minimize their effects.

3. All reports shall be signed by persons identified below:

   a. <u>For a corporation</u>: by a principal executive officer of at least the level of senior vice-president.

   b. <u>For a partnership or sole proprietorship</u>: by a general partner or the proprietor.

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

B. General Reporting Requirements (continued)

d. A duly authorized representative of a person designated in 3a, 3b or 3c of this requirement if;

(1) the authorization is made in writing by a person described in 3a, 3b, or 3c 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, operator of a waste management unit, 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

Any person signing a document under this Section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

4. Technical and monitoring reports specified in this Order are requested pursuant to Section 13267 of the Water Code. Failing to furnish the reports by the specified deadlines and falsifying information in the reports, are misdemeanors that may result in assessment of civil liabilities against the discharger.

5. 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
3614 East Ashlan Avenue
Fresno, CA 93726

or the current address if the office relocates.

C. Provisions for Monitoring

1. All analyses shall be made in accordance with the latest edition of: (1) "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater" (EPA 600 Series) and (2) "Test Methods for Evaluating Solid Waste" (SW 846-latest edition). The test method may be modified subject to application and approval of alternate test procedures under the Code of Federal Regulations (40 CFR 136).

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 Board.

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

3. 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 three 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.

   Record of monitoring information shall include:

   a. the date, exact place, and time of sampling or measurements,
   b. the individual(s) 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 analysis,
   f. the analytical techniques or methods used, and
   g. the results of such analyses.

4. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated at least yearly to ensure their continued accuracy.

C. Provisions For Monitoring (continued)

5. The discharger shall maintain a written sampling program sufficient to assure compliance with the terms of this Order. Anyone performing sampling on behalf of the discharger shall be familiar with the sampling plan.

6. The discharger shall construct all monitoring wells to meet or exceed the standards stated in the State Department of Water Resources Bulletin 74-81 and subsequent revisions, and shall comply with the reporting provisions for wells required by Water Code Sections 13750 through 13755.22

D. Standard Conditions for Facilities Subject to California Code of Regulations, Title 23, Division 3, Chapter 15 (Chapter 15)

1. All classified waste management units shall be designed under the direct supervision of a California registered civil engineer or a California certified engineering geologist. Designs shall include a Construction Quality Assurance Plan, the purpose of which is to:

   a. demonstrate that the waste management unit has been constructed according to the specifications and plans as approved by the Board.

   b. provide quality control on the materials and construction practices used to construct the waste management unit and prevent the use of inferior products and/or materials which do not meet the approved design plans or specifications.

2. Prior to the discharge of waste to any classified waste management unit, a California registered civil engineer or a California certified engineering geologist must certify that the waste management unit meets the construction or prescriptive standards and performance goals in Chapter 15, unless an engineered alternative has been approved by the Board. In the case of an engineered alternative, the registered civil engineer or certified engineering geologist must certify that the waste management unit has been constructed in accordance with Board-approved plans and specifications.

3. Materials used to construct liners shall have appropriate physical and chemical properties to ensure containment of discharged wastes over the operating life, closure, and post-closure maintenance period of the waste management units.

4. Closure of each waste management unit shall be performed under the direct supervision of a California registered civil engineer or California certified engineering geologist.

E. Conditions Applicable to Discharge Facilities Exempted From Chapter 15 Under Section 2511

1. If the discharger's wastewater treatment plant is publicly owned or regulated by the Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to California Code of Regulations, Title 23, Division 4, Chapter 14.

2. By-pass (the intentional diversion of waste streams from any portion of a treatment facility, except diversions designed to meet variable effluent limits) is prohibited. The Board may take enforcement action against the discharger for by-pass unless:

   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); <u>and</u>

   (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 back-up 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; <u>or</u>

   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. above.

3. A discharger that wishes to establish the affirmative defense of an upset (see definition in E.6 below) in an action brought for noncompliance shall demonstrate, through properly signed, contemporaneous operating logs, or other evidence, that:

   a. an upset occurred and the cause(s) can be identified;

E. Dischargers Exempt from Chapter 15 (continued)

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

c. the discharger submitted notice of the upset as required in paragraph B.1., above; and

d. the discharger complied with any remedial measures required by waste discharge requirements.

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

4. A discharger whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment, collection, 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.**

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 disposal. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.

6. Definitions

a. 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, or careless or improper action.

b. The monthly average discharge is the total discharge by volume during a calendar month divided by the number of days in the month that the facility was discharging. This number is to be reported in gallons per day or million gallons per day.

Where less than daily sampling is required by this Order, the monthly average shall be determined by the summation of all the measured discharges by the number of days during the month when the measurements were made.

E. **Dischargers Exempt from Chapter 15 (continued)**

c. The monthly average **concentration** is the arithmetic mean of measurements made during the month.

d. The "daily maximum" **discharge** is the total discharge by volume during any day.

e. The "daily maximum" **concentration** is the highest measurement made on any single discrete sample or composite sample.

f. A "grab" sample is any sample collected in less than 15 minutes.

g. Unless otherwise specified, a composite sample is a combination of individual samples collected over the specified sampling period;

(1) at equal time intervals, with a maximum interval of one hour

(2) 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.

7. Annual Pretreatment Report Requirements:

Applies to dischargers required to have a Pretreatment Program as stated in waste discharge requirements.)

The annual report shall be submitted **by 28 February** and include, but not be limited to, the following items:

a. A summary of analytical results from representative, flow-proportioned, 24-hour composite sampling of the influent and effluent for those pollutants EPA has identified under Section 307(a) of the Clean Water Act 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 (Code of Federal Regulations) Part 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

E. Dischargers Exempt from Chapter 15 (continued)

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 Part 136 and amendments thereto.

b. 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 system. 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.

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

d. 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:

(1) Complied with baseline monitoring report requirements (where applicable);

(2) Consistently achieved compliance;

(3) Inconsistently achieved compliance;

(4) Significantly violated applicable pretreatment requirements as defined by 40 CFR 403.8(f)(2)(vii);

E. Dischargers Exempt from Chapter 15 (continued)

(5) Complied with schedule to achieve compliance (include the date final compliance is required);

(6) Did not achieve compliance and not on a compliance schedule;

(7) Compliance status unknown.

A report describing the compliance status of any industrial user characterized by the descriptions in items (d)(3) through (d)(7) above shall be **submitted quarterly from the annual report date** to EPA and the Board. The report shall identify the specific compliance status of each such industrial user. This quarterly reporting requirement shall commence upon issuance of this Order.

e. 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 but not be limited to, a tabulation of categories of dischargers that were inspected and sampled; how many and how often; and incidents of noncompliance detected.

f. 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:

(1) Warning letters or notices of violation regarding the industrial user's 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;

(2) Administrative Orders regarding the industrial user's 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;

(3) Civil actions regarding the industrial user's 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. **Dischargers Exempt from Chapter 15 (continued)**

(4) Criminal actions regarding the industrial user's 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.

(5) Assessment of monetary penalties. For each industrial user identify the amount of the penalties;

(6) Restriction of flow to the treatment plant; or

(7) Disconnection from discharge to the treatment plant.

g. A description of any significant changes in operating the pretreatment program which differ from 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; and staffing levels.

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

i. A summary of public participation activities to involve and inform the public.

j. A description of any changes in sludge disposal methods and a discussion of any concerns not described elsewhere in the report.

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

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

and

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

Revised March 1993 to update phone number of Central Valley Regional Board.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESOLUTION NO. 91-101

AMENDMENT TO THE
WATER QUALITY CONTROL PLAN
FOR THE
TULARE LAKE BASIN (5D)

WHEREAS, Section 13240 of the California Water Code provides that regional water quality control boards shall formulate and adopt water quality control plans for all areas within the region; and

WHEREAS, the Regional Water Quality Control Board, Central Valley Region, (Regional Board) adopted the *Water Quality Control Plan for the Tulare Lake Basin* (5D), (Basin Plan), on 25 July 1975; and

WHEREAS, Texaco Refining and Marketing, Inc., submitted the following information to demonstrate that the injection zone (basal Etchegoin, Chanac, and Santa Margarita formations) of their four existing and three proposed injection wells in Sections 23 and 27, T29S, R27E, MDB&M, is hydrocarbon producing and is not a potential underground source of drinking water:

"Information Needs for Waste Water Injection, Texaco Refining and Marketing, Inc., Existing and Proposed Waste Water Injection Wells, Fruitvale Oil Field, Kern County, California", dated June 1989.

"Additional Information Needs for Waste Water Injection, Texaco Refining and Marketing, Inc., Existing and Proposed Waste Water Injection Wells, Fruitvale Oil Field, Kern County, California", dated February 1990; and

WHEREAS, San Joaquin Refining Company, Inc., submitted the following information to demonstrate that the injection zone (Santa Margarita formation) of their proposed injection well in Section 23, T29S, R27E, MDB&M, is hydrocarbon producing and is not a potential underground source of drinking water:

"San Joaquin Refining Company, Inc., Proposed Waste Water Injection Well, Fruitvale Oil Field, Kern County, California", submitted 28 March 1989.

"Additional Information Needs For Waste Water Injection, San Joaquin Refining Company, Proposed Waste Water Injection Well,Fruitvale Oil Field, Kern County, California", dated 10 May 1990; and

WHEREAS, to obtain Order No. 83-146, prescribing waste discharge requirements for four injection wells in Section 28, T29S, R27E, MDB&M, Environmental Protection Corporation submitted information demonstrating that the injection zone (basal Etchegoin and Chanac formations) is hydrocarbon producing and is not a potential underground source of drinking water (Order No. 83-146, Finding Nos. 7 and 8); and

WHEREAS the aforementioned existing and proposed injection well projects are within the administrative boundaries of the Fruitvale Oil Field, and additional refineries within the administrative boundaries of the Fruitvale Oil Field may reasonably be expected to propose injection well projects in the future; and

WHEREAS, the proposed and existing injection zones utilized by Dischargers within the Fruitvale Oil Field are the basal Etchegoin, Chanac, and Santa Margarita formations, which range in depth from 3,300 feet to 6,000 feet beneath the surface; and

WHEREAS, the current formation pressure in the basal Etchegoin formation is 1,050 psi, the anticipated formation pressure following 20 years of injection will be 1,078 psi at the well bore and 1,060 psi at a radial distance of 2,000 feet from the well bore, and the formation pressure 20 years after cessation of injection will be 1,051 psi both adjacent to the well bore and a radial distance of 2,000 feet from the well bore, representing a head increase of 2.3 feet (1 psi=2.3 feet of head); and

WHEREAS, the current formation pressure in the Chanac formation is 1,054 psi, the anticipated formation pressure following 20 years of injection will be 1,082 psi at the well bore and 1,064 psi at a radial distance of 2,000 feet from the well bore, and the formation pressure 20 years after cessation of injection will be 1,055 psi both adjacent to the well bore and a radial distance of 2,000 feet from the well bore, representing a head increase of 2.3 feet; and

WHEREAS, the current formation pressure in the Santa Margarita formation is 1,685 psi, the anticipated formation pressure following 20 years of injection will be 1,762 psi at the well bore and 1,712 psi at a radial distance of 2,000 feet from the well bore, and the formation pressure 20 years after cessation of injection will be 1,687 psi both adjacent to the well bore and a radial distance of 2,000 feet from the well bore and a radial distance of 2,000 feet from the well bore; representing a head increase of 4.6 feet; and

WHEREAS, the aforementioned changes in hydraulic head will be insufficient to cause migration of injected wastewater into overlying useable ground waters even in the absence of confinement. However, the existing and proposed injection zones are overlain by adequate thicknesses of low permeability clay layers which should confine the wastewaters to the intended injection zone and preclude contamination of the useable ground waters; and

WHEREAS, the Regional Board adopted Resolution No. 89-098 on 26 May 1989 designating all previously nondesignated surface and ground waters within the Tulare Lake Basin as municipal and domestic supply (MUN); and

WHEREAS, Resolution No. 89-098 authorizes an exception to the MUN designation for surface and ground waters where:

" 1. <u>Surface and ground waters where</u>:

a. The total dissolved solids (TDS) exceed 3,000 mg/l (5,000 uS/cm, electrical conductivity) and it is not reasonably expected by the Regional Board to supply a public water system, or

b. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that

cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or

c. The water source does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day."; and

"3. Ground waters:

a. Where the aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations (CFR), Section 146.4, for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3"; and

WHEREAS, the marine sediments of the basal Etchegoin, Chanac, and Santa Margarita formations, between 3,300 and 6,000 feet below the ground surface, are characterized as containing ground water in excess of 3,000 mg/l TDS; and

WHEREAS, the water bearing zones of the basal Etchegoin formation, Chanac formation, and Santa Margarita formation contain TDS and chloride concentrations which exceeds the Secondary Drinking Water Standards of Title 22, California Code of Regulations, by six to ten times; and

WHEREAS, chemical analyses of waters from the basal Etchegoin formation, Chanac formation, and Santa Margarita formation indicate that naturally occurring benzene, ethylbenzene and xylene concentrations exceed State Action Levels; and

WHEREAS, chemical analyses of water from the basal Etchegoin formation, Chanac formation, and Santa Margarita formation contain high levels of oil and grease; and

WHEREAS, the ground water contained in the basal Etchegoin, Chanac, and Santa Margarita formations within the Fruitvale Oil Field and one-quarter mile outside the boundary of the Fruitvale Oil Field is not used now as a municipal or domestic supply; and

WHEREAS, due to excessive TDS and chloride content, volatile organic compounds which exceed State Action Levels, high oil and grease content, and costs of treatment, the ground water contained in the basal Etchegoin, Chanac, and Santa Margarita formations within the Fruitvale Oil Field and within one-quarter mile outside the boundary of the Fruitvale Oil Field cannot reasonably be expected to supply a public water system; and

WHEREAS, portions of the basal Etchegoin, Chanac, and Santa Margarita formations produce commercial quantities of hydrocarbons in the Fruitvale Oil Field; and

WHEREAS, this contamination of the basal Etchegoin, Chanac, and Santa Margarita formations by natural processes and past disposal of oil field produced waters and refinery wastewaters cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices; and

WHEREAS, the State of California, Department of Conservation, Division of Oil and Gas, (CDOG) regulates Class II injection wells in the Fruitvale Oil Field which are used to dispose of fluids associated with the production of hydrocarbon energy (oil); the fluids do not constitute a hazardous waste; and

WHEREAS, the CDOG have, pursuant to 40 CFR, Section 146.4, administratively exempted as underground sources of drinking water aquifers of the basal Etchegoin, Chanac, and Santa Margarita formations within, and extending to one-quarter mile outside, the administrative boundary of the Fruitvale Oil Field; and

WHEREAS, portions of the upper ground water zone are used for domestic and agricultural supply and will retain the MUN designation above a depth of 3,000 feet; and

WHEREAS, the construction of the existing and proposed injection wells is such that the existing upper ground water zones will be fully protected; and

WHEREAS, the basal Etchegoin formation, Chanac formation, and Santa Margarita formation waters within the Fruitvale Oil Field and within one-quarter mile outside the boundary of the Fruitvale Oil Field qualify for an exception from designation as MUN based on the criteria in Resolution No. 89-098; and

WHEREAS, in accordance with requirements of the federal Clean Water Act and the California Water Code, the Regional Board, after due notice to all interested persons, held a public hearing on 26 April 1991 to receive public comment on proposed amendments to the Basin Plan; and

WHEREAS, the basin planning process has been determined to be functionally equivalent to an environmental impact report in accordance with the California Environmental Quality Act (Public Resources Code Section 21000, et seq.) and appropriate notices and waiting periods have been met: Therefore, be it

RESOLVED, that ground water contained in the basal Etchegoin formation, Chanac formation, and Santa Margarita formation within, and extending to one-quarter mile outside the administrative boundary of the Fruitvale Oil Field, as defined by the State of California, Department of Conservation, Division of Oil and Gas in *Application for Primacy in the Regulation of Class II Injection Wells Under Section 1425 of the Safe Drinking Water Act*, dated April 1981, is not suitable, or potentially suitable, for municipal or domestic supply (MUN); and be it further

RESOLVED, that portions of the upper ground water zone are used for domestic and agricultural supply and will retain the MUN designation above a depth of 3,000 feet; and be it further

RESOLVED, that the Executive Officer is directed to forward copies of this amendment to the Basin Plan and the record supporting its adoption to the State Water Resources Control Board for approval pursuant to Section 13245 of the California Water Code; and be it further

RESOLVED, that the Executive Officer is directed to file a Notice of Decision with the Secretary for Resources within 30 days after approval by the State Water Resources Control Board.

I, WILLIAM H. CROOKS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Central Valley Region, on 26 April 1991.

WILLIAM H. CROOKS, Executive Officer

DSJ:cjs

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESOLUTION NO. 89-098

AMENDMENT TO THE
WATER QUALITY CONTROL PLAN
FOR THE
TULARE LAKE BASIN (5D)

WHEREAS, California Water Code, Section 13240, provides that regional water quality control boards shall formulate and adopt water quality control plans for all areas within the region; and

WHEREAS, the Regional Water Quality Control Board, Central Valley Region, (Regional Board) adopted the Water Quality Control Plan for the Tulare Lake Basin (5D), hereafter Basin Plan, on 25 July 1975; and

WHEREAS, California Water Code, Section 13240, provides that water quality control plans shall conform to state policy for water quality control; and

WHEREAS, the State Water Resources Control Board (State Board) adopted Resolution No. 88-63, entitled "Sources of Drinking Water", on 19 May 1988 as state policy for water quality control; and

WHEREAS, previous to passage of State Board Resolution No. 88-63, the State Board held public workshops on 6 January 1988 and 6 April 1988 and a public hearing on 4 May 1988; and

WHEREAS, on 25 March 1988, the Regional Board adopted Resolution No. 88-051 which resolves that the ground water contained in the San Joaquin, Etchegoin, and Jacalitos Formations within one-half mile of existing surface impoundments P-1, P-2, P-3, P-4, P-4 1/2, P-5, P-6, P-7, P-8, P-9, P-10, P-11, P-12/12A, P-13, P-14, P-15, P-16, P-17, P-18, P-19, and P-20, and proposed surface impoundments P-21, P-24, P-25, P-27, P-28, and P-29 at the Kettleman Hills Facility (Sections 33 and 34, T22S, R18E, and Section 3, T23S, R18E, MDB&M) of Chemical Waste Management is not a potential source of drinking water; and

WHEREAS, in accordance with requirements of the federal Clean Water Act and the California Water Code, the Regional Board, after due notice to all interested persons, held a public hearing on 26 May 1989 to receive public comment on proposed amendments to the Basin Plan; and

WHEREAS, the basin planning process has been determined to be functionally equivalent to an environmental impact report in accordance with California Environmental Quality Act (Public Resources Code Section 21000, et seq.) and appropriate notices and waiting periods have been met: Therefore, be it

RESOLVED, that all surface and ground waters within the Tulare Lake Basin which currently have no beneficial use designation are hereby designated municipal and domestic supply (MUN), with the exception of:

1. Surface and ground waters where:

   a. The total dissolved solids (TDS) exceed 3,000 mg/l (5,000 uS/cm, electrical conductivity) and it is not reasonably expected by the Regional Board to supply a public water system, or

   b. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or

   c. The water source does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day.

2. Surface waters where:

   a. The water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Board, or

   b. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Board.

3. Ground waters:

   a. Where the aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations (CFR), Section 146.4, for the purpose of underground injection of fluids associated with the production

of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3;

and be it further

RESOLVED, that the above criteria not withstanding, waters presently used for municipal and domestic supply are hereby designated for protection as MUN; and be it further

RESOLVED, that this policy has no effect on the determination and effect of Resolution No. 88-051; and be it further

RESOLVED, that the Executive Officer is directed to forward copies of this amendment to the Basin Plan and the record supporting its adoption to State Board for approval pursuant to Section 13245 of the California Water Code; and be it further

RESOLVED, that the Executive Officer is directed to file a Notice of Decision with the Secretary for Resources within 30 days after State Board approval.

I, WILLIAM H. CROOKS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Central Valley Region on 26 May 1989.

William H. Crooks

WILLIAM H. CROOKS, Executive Officer

AMENDED 5/26/89

STAFF REPORT

AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE TULARE LAKE BASIN (5D)

The California Water Code provides that regional water quality control boards shall formulate and adopt water quality control plans or basin plans for all areas within their regions. The Regional Water Quality Control Board, Central Valley Region (Regional Board), adopted the Water Quality Control Plan for the Tulare Lake Basin (5D) on 25 July 1975. The Tulare Lake Basin Plan designates beneficial uses for surface waters but not ground waters. Instead, the Basin Plan specifies that the beneficial uses of ground water would be identified on a case-by-case basis.

All basin plans, in accordance with Section 13240 of the California Water Code, must conform with state policy for water quality control. The State Water Resources Control Board (State Board), on 19 May 1988, adopted a state policy (State Board Resolution No. 88-63) defining "sources of drinking water". In accord with this new policy, staff proposes the Regional Board amend the Tulare Lake Basin Plan to designate currently nondesignated waters in the basin as municipal and domestic supply (MUN) unless total dissolved solids exceed 3,000 mg/l and the waters cannot reasonably be expected to supply a public water system. The specific terms of the amendment are contained in a proposed resolution. Other waters excepted by the resolution include waters contaminated by natural processes or by human activity such that the waters cannot be treated for domestic use; waters that are insufficient in quantity to produce a sustained yield of 200 gallons per day; surface waters in systems designed or modified to collect, treat, or convey municipal, industrial or agricultural wastewaters or stormwater runoff; and ground waters in aquifers regulated as a geothermal energy producing source or exempted administratively pursuant to 40 Code of Federal Regulations, Section 146.4.

The proposed resolution also incorporates a previous Regional Board action. On 25 March 1988, Resolution No. 88-051 was adopted by the Regional Board, which found that ground water within one-half mile of certain impoundments located in the Kettleman Hills Facility of Chemical Waste Management is not a potential source of drinking water. The water bearing zones in the San Joaquin, Etchegoin, and Jacalitos Formations contain limited amounts of ground water with a total dissolved solids concentration of less than 10,000 mg/l; the quantity of ground water with less than 10,000 mg/l total dissolved solids is insufficient to supply a public water system for a period of years; and the ground water is not expected to supply any public water system. As a result, this water is not a potential source of drinking water and exemption of this water would be consistent with state policy.

CEQA Requirements for Basin Plan Amendments

The process of amending basin plans has been determined to be functionally equivalent to the process required under the California Environmental Quality Act. Therefore, it is exempt from the requirement to prepare an environmental impact report. The basin planning process includes an environmental review, consisting of a written report describing the proposed project and the potential adverse environmental impacts with alternatives and mitigation measures. An Environmental Checklist was completed and is included as Attachment A.

Interested persons were notified of the project by a Notice of Board Meeting. The notice was sent to over 400 persons and published in three local newspapers at least 45 days prior to the Board meeting. A Notice of Filing was also published in the three local newspapers by the same date and sent to persons requesting additional information. The Notice of Board Meeting and the Notice of Filing are included as Attachments B and C, respectively. Should the proposed resolution be adopted by the Regional Board and State Board, a Notice of Decision will be filed with the Secretary of Resources.

RECOMMENDATION

Adopt the proposed resolution designating currently non-designated waters of the Tulare Lake Basin, except the ground water found within one half mile of certain impoundments in the Kettleman Hills Facility of Chemical Waste Management, as municipal and domestic supply in accordance with state policy.

STATE OF CALIFORNIA

OFFICE MEMO
STD. 100 (REV. 10/87)
87 46331

DATE: 3/11/99

TO: Mr. Raymond Ouellette
Kennedy/Jenks Consultants
2151 Michelson Drive, Ste 100
Irvine, CA 92612-1311

ROOM/STA. NO.

FROM:
Betty Yee
RWQCB 5

PHONE NUMBER: 559-445-5128
ATSS ☐
ROOM/STA. NO.

SUBJECT: Resolution # 89-098

Enclosed is a copy of Resolution # 89-098. Since the 2nd edition of the Water Quality Control Plan for the Tulare Lake Basin was adopted subsequent to this resolution the Basin Plan language supercedes the resolution. If you would like a copy of the Basin Plan (which was not printed), I have a copy with all the 8½ x 11 inch pages available for $28. This copy is only missing 2 large maps. The Basin Plan is also available from our website at:
http://www.swrcb.ca.gov/~rwqcb5
If you have any questions, please call me at the above number.

BY

Put your thoughts to work. Submit a **MERIT AWARD SUGGESTION.**

STATE WATER RESOURCES CONTROL BOARD

RESOLUTION NO. 88-63

ADOPTION OF POLICY ENTITLED "SOURCES OF DRINKING WATER"

WHEREAS

1. California Water Code Section 13140 provides that the State Board shall formulate and adopt State Policy for Water Quality Control; and,

2. California Water Code Section 13240 provides that Water Quality Plans "shall conform" to any State Policy for Water Quality Control; and,

3. The Regional Boards can conform the Water Quality Control Plans to this policy by amending the plans to incorporate the policy; and,

4. The State Board must approve any conforming amendments pursuant to Water Code Section 13245; and,

5. "Sources of drinking water" shall be defined in the Water Quality Control Plans as those water bodies with beneficial uses designated as suitable, or potentially suitable, for municipal or domestic water supply (MUN); and,

6. The Water Quality Control Plans do not provide sufficient detail in the description of water bodies designated MUN to judge clearly what is, or is not, a source of drinking water for various purposes.

THEREFORE BE IT RESOLVED:

All surface and ground waters of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards[1] with the exception of:

1. <u>Surface and ground waters where</u>:

a. The total dissolved solids (TDS) exceed 3,000 mg/L (5,000 uS/cm, electrical conductivity) and it is not reasonably expected by Regional Boards to supply a public water system, or

b. There is contamination, either by natural processes or by human activity (unrelated to the specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or

c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

2. Surface Waters Where:

a. The water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards; or,

b. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards.

3. Ground water where:

The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations, Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

4. Regional Board Authority to Amend Use Designations:

Any body of water which has a current specific designation previously assigned to it by a Regional Board in Water Quality Control Plans may retain that designation at the Regional Board's discretion. Where a body of water is not currently designated as MUN but, in the opinion of a Regional Board, is presently or potentially suitable for MUN, the Regional Board shall include MUN in the beneficial use designation.

The Regional Boards shall also assure that the beneficial uses of municipal and domestic supply are designated for protection wherever those uses are presently being attained, and assure that any changes in beneficial use designations for waters of the State are consistent with all applicable regulations adopted by the Environmental Protection Agency.

The Regional Boards shall review and revise the Water Quality Control Plans to incorporate this policy.

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1 **This policy does not affect any determination of what is a potential source of drinking water for the limited purposes of maintaining a surface impoundment after June 30, 1988, pursuant to Section 25208.4 of the Health and Safety Code.**

CERTIFICATION

The undersigned, Administrative assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a policy duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 19, 1988.

\s\

Maureen Marché
Administrative Assistant to the Board

California Regional Water Quality Control Board
Central Valley Region

Water Quality Control Plan for the Tulare Lake Basin Second Edition - 1995

Board Members
Karl E. Longley, Chair
Hugh V. Johns, Vice Chair
Hank Abraham
Steven Butler
Ernie Pfanner
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William H. Crooks, Executive Officer

II. EXISTING AND POTENTIAL BENEFICIAL USES

Protection and enhancement of beneficial uses of water against quality degradation is a basic requirement of water quality planning under the Porter-Cologne Water Quality Control Act. In setting water quality objectives, the Regional Water Board must consider past, present, and probable future beneficial uses of water.

Significant points concerning beneficial uses are:

1. All water related problems can be stated in terms of whether there is water of sufficient quantity and quality to protect or enhance beneficial uses.

2. Fish, plants, and other wildlife, as well as humans, depend on and use water beneficially both directly or indirectly.

3. Defined beneficial uses do not include all possible uses of water. For example, use of waters for disposal of wastewaters is not included as a beneficial use. Similarly, the use of water for the dilution of salts in other waters is not a beneficial use. These may, in some cases, be reasonable and desirable uses of water, but they are not protected uses and are subject to regulation as activities that may harm protected uses.

4. The protection and enhancement of beneficial uses requires that certain quality and quantity objectives be met for surface and ground waters.

5. Quality of water in upstream reaches and upper aquifers may impact the quality and beneficial uses of downstream reaches and lower aquifers.

Beneficial use designations (and water quality objectives, see Chapter III) must be reviewed at least once during each three-year period for potential modification as appropriate {40 CFR Part 131.20}.

The beneficial uses and abbreviations as defined and listed below are the standard designations used in all basin plans in California with the exception of the definition for Fish Spawning (SPWN) and Warm Freshwater Habitat (WARM). The standard statewide definition for SPWN includes spawning of both warm and cold water fish. In the Tulare Lake Basin, warm water spawning is considered to occur wherever a warm freshwater habitat exists while only select cold water habitats are suitable for spawning by cold water species. For example, certain cold water species require gravel beds in order to spawn. For this reason, for the Tulare Lake Basin, SPWN has been modified to limit the designation to suitable reaches of cold water streams and WARM has been modified to clarify that it includes sensitive fish propagation stages.

Municipal and Domestic Supply (MUN) - Uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply.

Agricultural Supply (AGR) - Uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

Industrial Service Supply (IND) - Uses of water for industrial activities that do not depend primarily on water quality, including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

Industrial Process Supply (PRO) -Uses of water for industrial activities that depend primarily on water quality.

Hydropower Generation (POW) - Uses of water for hydropower generation.

Water Contact Recreation (REC-1) - Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

Non-Contact Water Recreation (REC-2) - Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Warm Freshwater Habitat (WARM) - Uses of water that support warm water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

WARM includes support for reproduction and early development of warm water fish.

Cold Freshwater Habitat (COLD) - Uses of water that support cold water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Wildlife Habitat (WILD) - Uses of water that support terrestrial or wetland ecosystems, including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Rare, Threatened, or Endangered Species (RARE) - Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Spawning, Reproduction, and/or Early Development (SPWN) - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

SPWN shall be limited to cold water fisheries.

Migration of Aquatic Organisms (MIGR) - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

Ground Water Recharge (GWR) - Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Freshwater Replenishment (FRSH) - Uses of water for natural or artificial maintenance of surface water quantity or quality.

Aquaculture (AQUA) - Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Preservation of Biological Habitats of Special Significance (BIOL) - Uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

Navigation (NAV) - Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

The existing and probable future beneficial uses which currently apply to surface waters are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams. In some cases a beneficial use may not be applicable to the entire body of water. In these cases the Regional Water Board's judgement will be applied. It should be noted that it is impractical to list every surface water body in the Region. For unidentified water bodies, the beneficial uses will be evaluated on a case-by-case basis.

Upstream from the foothill reservoirs, the quality of surface waters remains good to excellent. The quality of the major streams is suitable for all beneficial uses. Beneficial uses below the dams, however, may be significantly impacted because of the reduced flows in the channels.

For ground water, the following beneficial uses have been identified and occur throughout the Basin: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Service Supply (IND), Industrial Process Supply (PRO), Water Contact Recreation (REC-l), and Wildlife Habitat (WILD).

Figure II-2 and Table II-2 present the AGR, IND, PRO, REC-1, REC-2, and WILD beneficial uses of ground water that existed as of 1993. Due to the "Sources of Drinking Water Policy," all ground waters are designated MUN (the use may be existing or potential) unless specifically exempted by the Regional Water Board and approved for exemption by the State Water Board. Ground water areas exempted from MUN are footnoted in Table II-2. In addition, unless otherwise designated by the Regional Water Board, all ground waters in the Region are considered suitable or potentially suitable, at a minimum, for agricultural supply (AGR), industrial supply (IND), and industrial process supply (PRO).

Existing beneficial uses generally apply within the listed Detailed Analysis Unit (DAU). Due to the size of the DAUs, however, the listed uses may not exist throughout the DAU. For the purpose of assigning beneficial uses, the term ground water is defined in Chapter I.

In considering any exceptions to the beneficial use designation of MUN, the Regional Water Board employs the following criteria:

1. The TDS must exceed 3,000 mg/l (5,000 µmhos/cm EC) and the aquifer cannot be reasonably expected to supply a public water system, or

2. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or

3. The water source cannot provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day, or

4. The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

To be consistent with State Water Board Resolution No. 88-63 in making exceptions to beneficial use designations other than municipal and domestic supply (MUN), the Regional Water Board will consider criteria for exceptions, parallel to Resolution No. 88-63 exception criteria, which would indicate limitations on those other beneficial uses as follows:

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

1. There is pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for agricultural use using either Best Management Practices or best economically achievable treatment practices, or

2. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day, or

3. The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR Section 261.3.

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

1. There is pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for industrial use using either Best Management Practices or best economically achievable treatment practices, or

2. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

TABLE II-1
TULARE LAKE BASIN
SURFACE WATER BENEFICIAL USES

Stream	MUN	AGR	IND	PRO	POW	REC-1	REC-2	WARM	COLD	WILD	RARE	SPWN	GWR	FRSH
552, 551 Kings River														
North Fork, Upper					•	•	•	•	•	•	•	•		•
Main Fork, Above Kirch Flat	•					•	•	•	•	•	•	•		•
Kirch Flat to Pine Flat Dam (Pine Flat Reservoir)					•	•	•	•	•	•				•
Pine Flat Dam to Friant-Kern	•	•			•	•	•	•	•	•		•	•	•
Friant Kern to Peoples Weir	•	•		•		•	•	•		•			•	
Peoples Weir to Stinson Weir on North Fork and to Empire Weir No. 2 on South Fork		•				•	•	•		•			•	
553, 558 Kaweah River														
Above Lake Kaweah	•				•	•	•	•	•	•	•	•		•
Lake Kaweah					•	•	•	•		•				•
Below Lake Kaweah	•	•	•	•		•	•	•		•			•	
555, 558 Tule River														
Above Lake Success	•	•			•	•	•	•	•	•	•	•		•
Lake Success		•			•	•	•	•		•				•
Below Lake Success	•	•	•	•		•	•	•		•			•	
554, 557 Kern River														
Above Lake Isabella	•				•	•	•	•	•	•	•	•		•
Lake Isabella					•	•	•	•	•	•				•
Lake Isabella to KR-1‡					•	•	•	•	•	•	•			
Below KR-1‡	•	•	•	•	•	•	•	•		•	•		•	
555, 558 Poso Creek		•				•	•	•	•	•			•	•
552 Mill Creek, Source to Kings River	•					•	•	•		•			•	•
552, 553, 554, 555 Other East Side Streams	•	•				•	•	•	•	•			•	
556, 559 West Side Streams		•	•	•		•	•	•		•	•		•	
551, 557, 558 Valley Floor Waters		•	•	•		•	•	•		•	•		•	

‡ KR-1: Southern California Edison Kern River Powerhouse No. 1.

TABLE II-2
TULARE LAKE BASIN
GROUND WATER BENEFICIAL USES*

HYDROLOGIC UNIT	DAU	MUN	AGR	IND	PRO	REC-1	REC-2	WILD
Delta-Mendota Basin								
	216	•	•	•				
	235	•	•	•	•		•	•
	237	•	•	•				
Kings Basin								
	233	•	•	•	•	•	•	
	234	•	•	•				
	235	•	•	•	•			
	236	•	•	•	•			
	237	•	•	•				
	239	•	•	•	•			
	240	•	•					
Kaweah Basin	242	•	•	•	•	•	•	
Tulare Lake Basin								
	238	•	•	•	•			
	241	•	•	•				
	246	•	•	•				
Tule Basin								
	243	•	•	•	•			•
	257	•	•					
Pleasant Valley Basin	245	•	•	•				
Westside Basin	244	•	•	•				

* Table II-2 presents the AGR, IND, PRO, REC-1, REC-2, and WILD beneficial uses of ground water that existed as of 1993.

TABLE II-2
TULARE LAKE BASIN
GROUND WATER BENEFICIAL USES* (continued)

HYDROLOGIC UNIT	DAU	MUN	AGR	IND	PRO	REC-1	REC-2	WILD
Kern County Basin								
	245	•	•	•				
	254[a]	•	•	•	•	•	•	•
	255	•	•	•				•
	256	•	•	•	•			
	257	•	•	•		•		
	258	•	•	•	•			
	259[b]	•	•	•				
	260	•		•				
	261	•	•	•				
Satellite Basins								
Panoche Valley		•						
Squaw Valley		•	•	•				
Kern River Valley		•	•	•				
Walker Basin Creek Valley		•	•	•				
Cummings Valley		•	•	•		•	•	
Tehachapi Valley West		•	•	•		•	•	•
Castac Lake Valley		•	•	•				
Vallecitos Creek Valley		•						
Cedar Grove Area		•						
Three Rivers Area		•						
Springville Area		•		•				
Templeton Mountain Area		•						
Monache Meadows Area		•	•				•	
Secator Canyon Valley		•						
Rockhouse Meadow Valley		•				•		
Linns Valley		•		•				
Brite Valley		•	•	•		•	•	•
Bear Valley		•	•	•		•	•	•
Cuddy Canyon Valley		•		•			•	
Cuddy Ranch Area		•	•					
Cuddy Valley		•	•	•				
Mill Potrero Area		•		•			•	
All Other Ground Waters[c]		•						

TABLE II-2
TULARE LAKE BASIN
GROUND WATER BENEFICIAL USES (continued)
Beneficial Use Exceptions

[a] Ground water contained in the lower Transition Zone and Santa Margarita formation within 3,000 feet of the Kern Oil and Refining Company proposed injection wells in Section 25, T30S, R28E, MDB&M, is not suitable, or potentially suitable, for municipal or domestic supply (MUN).

Ground water contained in the basal Etchegoin formation, Chanac formation, and Santa Margarita formation within, and extending to one-quarter mile outside the administrative boundary of the Fruitvale Oil Field, as defined by the State of California, Department of Conservation, Division of Oil and Gas in *Application for Primacy in the Regulation of Class II Injection Wells Under Section 1425 of the Safe Drinking Water Act*, dated April 1981, is not suitable, or potentially suitable, for municipal or domestic supply (MUN). However, the upper ground water zone (ground water to a depth of 3,000 feet) retains the MUN beneficial use.

[b] Ground water and spring water within 1/2 mile radius of the McKittrick Waste Treatment (formerly Liquid Waste Management) site in Section 29, T30S, R22E, MDB&M, have no beneficial uses.

[c] Ground water in the San Joaquin, Etchegoin, and Jacalitos Formations within one-half mile of existing surface impoundments P-1, P-2, P-3, P-4, P-4 1/2, P-5, P-6, P-7, P-8, P-9, P-10, P-11, P-12/12A, P-13, P-14, P-15, P-16, P-17, P-18, P-19, and P-20, and proposed surface impoundments P-21, P-24, P-25, P-27, P-28, and P-29 at the Kettleman Hills Facility (Sections 33 and 34, T22S, R18E, and Section 3, T23S, R18E, MDB&M) of Chemical Waste Management is not a municipal or domestic supply (MUN).