

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION

CLEANUP AND ABATEMENT ORDER NO. 93-49

CHEVRON U.S.A. PRODUCTS COMPANY AND JAMES C. SILVER;  
2712 WASHINGTON STREET

ROBERTA H. GREEN;  
2126 MAIN STREET

WILLIS AND LILLIE SLAUGHTER;  
2103 MAIN STREET

JULIAN, CALIFORNIA  
SAN DIEGO COUNTY

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board) finds that:

1. Chevron U.S.A. Products Company (Chevron) owned and operated a retail service station located at 2712 Washington Street in Julian, California from 1971 until 1990 when the service station was demolished. Mr. James C. Silver owns the property on which the service station was located. Additionally, Mr. Silver operated a retail service station at the subject site prior to Chevron occupying the site in 1971.
2. On August 21, 1989 Regional Board staff was notified by the County of San Diego, Hazardous Materials Management Division (HMMD), of an unauthorized release of petroleum hydrocarbons which resulted in elevated levels of benzene and toluene, detected in a municipal water well located downgradient of the Chevron service station. HMMD indicated in the unauthorized release notification that the suspected source of the petroleum hydrocarbons was the underground fuel storage tanks located at the Chevron service station.
3. In August, 1989 Chevron contracted with Groundwater Technology, Inc. (GTI) to conduct a preliminary groundwater assessment to investigate the presence of the benzene and toluene identified in groundwater at the Chevron service station site. In September, 1989 and January, 1990 GTI installed and developed five groundwater monitoring wells, GT1, GT2, GT3, GT4 and GT5. The results of the laboratory analysis indicated that three of the five wells had elevated concentrations of total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and total xylenes. Concentrations of volatile organic compounds found in petroleum products in the groundwater samples were as high as:

<u>Constituents</u>	<u>Concentrations</u>
Benzene	1600 µg/l
Toluene	1300 µg/l
Ethylbenzene	280 µg/l
Total Xylenes	4600 µg/l

4. Groundwater Technology, Inc. monitoring wells GT1 (near the old Chevron station, 2712 Washington Street), GT4 (near the Julian Cider Mill, 2103 Main Street) and GT5 (near the former Julian Garage, 2126 Main Street) show high levels of total petroleum hydrocarbons and benzene. The last round of sampling, performed on November 16, 17 and 18, 1992 provided the following data:

<u>Well</u>	<u>Benzene</u>	<u>TPH</u>
GT1	1,000 µg/l	4,000 µg/l
GT4	380 µg/l	3,700 µg/l
GT5	550 µg/l	3,100 µg/l

On September 3 through 14, 1991, GTI installed four additional ground water monitoring wells as part of Chevron's off-site investigation: GT6, GT7, GT8 and GT9. GT9 (near the N.H. Cozen's Mobil site, 1913 Main Street) also showed high levels of total petroleum hydrocarbons and benzene. Sampling of GT9, performed on November 16, 17 and 18, 1993 revealed benzene at 94 µg/l and TPH at 2,100 µg/l.

5. On July 19, 1990, under oversight of Mr. Michael Porter of the HMMD, Chevron removed five underground storage tanks from 2712 Washington Street. The contents and volumes of the underground storage tanks were reported by Chevron as follows:

<u>Tank</u>	<u>Contents</u>	<u>Capacity (gallons)</u>
1	Chevron Unleaded Gasoline	9,980
2	Chevron Supreme Unleaded Gasoline	9,980
3	Chevron Regular Gasoline	9,980
4	Waste Oil	1,000
5	Heating Fuel (Diesel #2)	1,000

Reports of the tank removal indicate that there were no holes or signs of corrosion in the three gasoline tanks, however there were holes in the diesel and waste oil tanks.

Soil samples collected from beneath the underground tanks, following removal, were analyzed and found to contain as

much as 2200 milligrams per liter (mg/kg) of TPH. In addition, concentrations of benzene, toluene, ethylbenzene and total xylenes were detected as high as 26 mg/kg, 180 mg/kg, 39 mg/kg and 220 mg/kg respectively. In prior years the property was occupied by an automotive repair shop and gasoline service stations. Chevron has installed 22 borings and converted 11 of these to soil vapor extraction wells. In addition, Chevron has excavated contaminated soil and received closure on all but the gasoline tanks. This work was completed at a cost of \$110,400.

6. Mrs. Roberta H. Green currently owns the property located at 2126 Main Street in Julian, California. The 2126 Main Street property was willed to Mrs. Green, who became owner in late 1988 - early 1989. The property is currently the site of the Julian Auto Parts retail store. Past uses of the property have included an automotive repair shop and a gasoline service station.
7. Mrs. Green has reported that prior to her inheritance, the 2126 Main Street property was owned by her father and two partners for several decades. During their ownership several companies leased the property for automotive related businesses.
8. Four underground storage tanks were formally located on the 2126 Main Street site. In addition Mrs. Green has reported that the underground storage tanks and related appurtenances have been out of service since the 1960's or early 1970's. Three of the four tanks had capacities of 550 gallons each, and the fourth tank had a 1000 gallon capacity. All of the tanks were reported to have contained gasoline.
9. On September 9, 1986 Caltrans removed two of the 550 gallon tanks. The two tanks were located in the Caltrans right-of-way in front of Julian Auto Parts. At the time of removal an HMMD inspector noted that the two tanks were in good condition with no obvious holes. However, soil which was excavated from around the tanks was contaminated with gasoline. Approximately 1/2 cubic yard of gasoline-contaminated soil was removed from the site, under proper manifest, with the remaining excavated soil being backfilled into the original excavation.
10. On April 24, 1990 the remaining two underground storage tanks, a 550 gallon tank and a 1000 gallon tank, were removed under the inspection of HMMD inspector Mike Porter. Mr. Porter identified gasoline odors and dark staining of the soil in the excavation, both in the backfill and the

native material. Soil samples collected from the excavation beneath both removed tanks contained concentrations of total petroleum hydrocarbon contamination as high as 2,690 mg/kg.

11. On May 22, 1990 the Regional Board was formally notified by HMMD that an unauthorized release from an underground storage tank/system had occurred at 2126 Main Street, Julian, California.
12. On May 3, 1991 Regional Board staff received a report prepared by Enecotech S.W., Inc. (Enecotech), the environmental consultant for Mrs. Green, dated March 25, 1991 and titled "PRELIMINARY SITE ASSESSMENT, 2126 MAIN STREET, JULIAN, CALIFORNIA". The report contained the results of a limited subsurface soil investigation. Enecotech drilled three soil borings in the area of the four excavated underground storage tanks. Results of laboratory analysis of soil samples collected from the three soil borings contained the following maximum concentrations:

<u>Constituents</u>	<u>Concentrations</u>
TPH	6,130 mg/kg
Benzene	<4 mg/kg
Toluene	66 mg/kg
Ethylbenzene	41 mg/kg
Total Xylenes	265 mg/kg
13. To date no groundwater investigation has been initiated at the 2126 Main Street site. Additionally, complete soil delineation of the TPH contamination has not been accomplished at this site.
14. Willis and Lillie Slaughter own the property located at 2103 Main Street, Julian, California. Currently a retail business called the Julian Cider Mill occupies the site.
15. On May 10, 1990, under observation of HMMD inspector, Carol Spangenberg, six underground storage tanks were removed from the 2103 Main Street site. Ms. Spangenberg supervised the collection of 10 soil samples from the excavation following removal of the six tanks. Laboratory results from the analysis of the soil samples indicated TPH contamination in concentrations as high as 6,010 mg/kg.
16. With the exception of the soil samples collected immediately following tank removal no additional soil contamination

investigation has been conducted at 2103 Main Street, nor has any groundwater investigation been initiated at this site.

17. The following parties are named as "dischargers" in this cleanup and abatement order pursuant to Water Code Section 13304:

- a) Chevron U.S.A., Inc. is named as a discharger in their capacity as owner and operator of the Chevron Service Station at 2712 Washington Street between 1981 and 1990
- b) Mr. James C. Silver is named as a discharger in his capacity as current and pre-1971 owner of the 2712 Washington Street property.
- c) Ms. Roberta H. Green is named as a discharger in her capacity as current owner of the 2126 Main Street property.
- d) Willis and Lillie Slaughter are named as dischargers in their capacity as owners of the 2103 Main Street property, the site of the Julian Cider Mill.

18. The Julian Communities Services District (JCSD) supplies water to approximately one-thousand people. The population is comprised of 300 full-time residents and 700 school children. JCSD owns eight water supply wells and currently operates five of these wells (Well No. 5 has collapsed, Well No. 7 is currently dry and Well No. 2 was taken out of service; it was the site of petroleum contamination in 1977). In addition, JCSD obtains water from four privately owned wells. Elevated concentrations of fuel constituents were also found in the ground water at Well Nos. 1 and 8; these wells are currently in use by the JCSD.

19. The most recent sampling and analysis of the JCSD wells took place on September 7, 1989. Since that time, influent and effluent samples have been taken to determine the efficacy of the GAC but individual wells have not been sampled for petroleum components. The results were as follows:

<u>Well No.</u>	<u>Benzene Concentration</u>
JCSD No.1	191 µg/l
JCSD No.2	7.3 µg/l
JCSD No.3	1.1 µg/l
JCSD No.4	0.3 µg/l
JCSD No.5	0.2 µg/l

JCSD No.6	0.2 µg/l
JCSD No.7	not sampled
JCSD No.8	54 µg/l

20. The subsurface plume of petroleum hydrocarbons found in the ground water, as described in Findings 3 and 18, appears to be an accumulation of several coalescing contaminant sources from leaking underground storage tanks at 2712 Washington Street, 2126 Main Street and 2103 Main Street. Based on the soil contamination data cited in the previous findings of this order, it is known that gasoline or other fuel was released from underground storage tanks at the three sites. The ground water wells cited in Findings 3 and 18 are in close proximity to the three sites and it is likely that migration or leaching of contaminants from the soils into the ground water at the three sites has occurred.
21. Chevron installed a Granular Activated Carbon (GAC) system at the Julian Community Services District (JCSD) water treatment facility in October 1989. This system, containing 20,000 pounds of GAC in a sealed tank, removes dissolved gasoline hydrocarbons found in the ground water. A blend of water from all the operating wells is delivered to the water treatment facility, treated and delivered to the population of Julian. Installation of the GAC, along with the installation and testing of the nine monitoring wells, has cost Chevron more than \$800,000. Laboratory analysis has cost Chevron \$17,129 to date. Continued maintenance of the GAC and monitoring of the wells will cost \$98,000 annually..
22. The "Comprehensive Water Quality Control Plan Report, San Diego Basin (9)" (hereinafter Basin Plan) was adopted by this Regional Board on March 17, 1975 and approved by the State Water Resources Control Board (State Board) on March 20, 1975. Subsequent revisions to the Basin Plan have also been adopted by the Regional Board and approved by the State Board.
23. The three sites mentioned in this order, 2712 Washington Street, 2126 Washington Street and 2103 Main Street, are all located in the Boulder Creek Hydrologic Area (907.40) of the San Diego Hydrologic Unit (907.00), as described in the Basin Plan.
24. The following designated beneficial uses for the surface waters in the Boulder Creek Hydrologic Area are established in the Basin Plan:

- a. Municipal and Domestic Supply
  - b. Agricultural Supply
  - c. Industrial Service Supply
  - d. Industrial Process Supply
  - e. Water Contact Recreation
  - f. Non-Contact Water Recreation
  - g. Warm Fresh-Water Habitat
  - h. Cold Fresh-Water Habitat
  - i. Wildlife Habitat
25. The following designated beneficial uses for the ground waters in the Boulder Creek Hydrologic Area are established in the Basin Plan:
- a. Municipal and Domestic Supply
  - b. Agricultural Supply
26. The Basin Plan contains the following objective which applies to all ground waters in the San Diego Region:
- Ground water shall not contain taste or odor producing substances in concentrations that cause nuisance or adversely affect beneficial uses.
27. Gasoline is a mixture of over 200 petroleum derived chemicals and a few synthetic products that are added to improve fuel performance. The majority of gasoline components range from C<sub>4</sub> to C<sub>12</sub> hydrocarbons. The gasoline components benzene, toluene, xylene and ethylbenzene are of particular concern because they pose a threat to human health, have the potential to move through soil and contaminate ground water and their vapor is highly flammable and explosive. The additives ethylene dibromide, ethylene dichloride, tetramethyl lead and tetraethyl lead are also found in gasoline. Gasoline components may also adversely affect the taste and odor of water and thereby may cause persons to discontinue their use of a drinking water supply or may otherwise affect the public welfare. The percent weight of benzene, toluene, xylene, ethylbenzene, ethylene dibromide, and ethylene dichloride typically found in gasoline is summarized below:

<u>Compound</u>	<u>Weight Percent in Gasoline</u>
Benzene	0.12 - 3.50
Toluene	2.73 - 21.80
Xylene (ortho)	0.68 - 2.86
Xylene (meta)	1.77 - 3.87

Xylene (para)	0.77 - 1.58
Ethylbenzene	0.36 - 2.86
Ethylene dibromide	0.7 - 177.2 parts per million
Ethylene dichloride	150 - 300 parts per million

28. The discharge of petroleum hydrocarbons containing benzene, toluene, xylene, ethylbenzene, organo-lead, ethylene dichloride (also known as 1,2 -dichloroethane) , and ethylene dibromide has created a condition of pollution, as defined in California Water Code Section 13050, in the ground water based on the following criteria:

- a. The following maximum contaminant levels (MCL's) for benzene, xylene, ethylbenzene, total lead, ethylene dibromide, and ethylene dichloride are established for primary drinking water constituents in the California Code of Regulations (CCR), Title 22, Division 4, Chapter 15, Article 5.5, Section 64444.5:

<u>Constituent</u>	<u>Maximum Contaminant Level</u>
Benzene	1 $\mu\text{g/l}$
Xylene	1750 $\mu\text{g/l}$
Ethylbenzene	680 $\mu\text{g/l}$
Total Lead	50 $\mu\text{g/l}$
Ethylene dibromide	0.02 $\mu\text{g/l}$
Ethylene dichloride	0.5 $\mu\text{g/l}$

Toluene is regulated under federal law. The following MCL has been established for toluene in Title 40, Code of Federal Regulations, Chapter 1, Subchapter D, Part 141, Section 141.61 is used:

<u>Constituent</u>	<u>Maximum Contaminant Level</u>
Toluene	1000 $\mu\text{g/l}$

- b. The U.S. Environmental Protection Agency, has evaluated the literature for taste and odor detection levels for benzene, ethylbenzene, toluene, and xylene. The findings of the literature evaluation is summarized in Federal Register, Volume 54, Number 97, pages 22138-22139. E.P.A. has proposed that the following secondary maximum contaminant levels (MCLs) be established based upon taste or odor detection levels:

<u>Constituent</u>	<u>Secondary MCL (proposed)</u>
Ethylbenzene	29 $\mu\text{g/l}$
Toluene	42 $\mu\text{g/l}$
Xylene(s)	17 $\mu\text{g/l}$

- c. The results of a literature evaluation by McKee and Wolf contained in the publication "Water Quality Criteria", page number 230, report the threshold odor concentration of commercial gasoline (TPH) in water as 5  $\mu\text{g/l}$ ; with 10  $\mu\text{g/l}$  giving a strong odor.
  - d. Municipal use is a designated beneficial use of the ground waters of the Boulder Creek Hydrologic Area.
  - e. Gasoline was detected in the soil at 2712 Washington Street, 2126 Main Street and 2103 Main Street in Julian. The leaching of gasoline containing benzene, toluene, xylene, ethylbenzene, lead, ethylene dibromide and ethylene dichloride from the soil has caused or threatens to cause the applicable MCL's in the underlying ground water to be exceeded.
  - f. The unauthorized release of petroleum hydrocarbons from sites located at 2712 Washington Street, 2103 Main Street and 2126 Main Street have caused or contributed to the ground water in four municipal water supply wells owned by the Julian Community Services District exceeding the applicable MCL for benzene.
29. The basis for the directives contained in this cleanup and abatement order is described in the State Water Resources Control Board's Resolution No. 92-49, Policies and Procedures For Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304. The basis includes 1) the characteristics of the site; 2) applicable state and federal statutes and regulations; 3) the Basin Plan; 4) State Water Board and Regional Board policies, including State Water Board Resolution Nos. 68-16 (Statement of Policy with Respect to Maintaining High Quality Waters in California) and 88-63 (Sources of Drinking Water); and 5) relevant standards, criteria, and advisories adopted by other state and federal agencies.
30. Pursuant to State Water Board Resolution No. 68-16 the Regional Board is required to ensure that dischargers are required to clean up and abate the effects of discharges in a manner that promotes the attainment of background water quality, or the highest water quality which is reasonable if background levels cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social tangible and intangible; any alternative cleanup levels less stringent than background shall:

- a) be consistent with maximum benefit to the people of the state;
  - b) not unreasonably affect present and anticipated beneficial use of such water; and
  - c) not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.
31. State Board regulations governing waste discharges to land (CCR, Title 23, Division 3, Chapter 15) require that cleanup and abatement actions intended to contain waste at the place of release shall implement the applicable provisions of that chapter, to the extent feasible (23 CCR 2511(d)). Also, Article 5 of that chapter prescribes a methodology for establishing cleanup levels (23 CCR 2550.4) and undertaking corrective actions where discharges to a waste management unit have resulted in discharges subject to Water Code Section 13304.
32. State Board regulations governing site investigation and corrective action at underground storage tank unauthorized release sites are contained in CCR, Title 23, Division 3, Chapter 16. In particular, Article 11, commencing with Section 2720 is applicable to this cleanup and abatement order.
33. This enforcement action is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000 et seq.) in accordance with Section 15321, Chapter 3, Title 14, California Code of Regulations.

**IT IS HEREBY ORDERED**, that pursuant to Section 13304 of the California Water Code, the dischargers shall comply with the following Directives:

1. The dischargers shall take whatever action is necessary, under the guidance of the County of San Diego Environmental Health Services Land Use Department, to:
  - a) Provide, effectively operate and maintain treatment facilities to provide water to users in the Julian Communities Services District that continually meets the applicable primary drinking water MCL's for benzene, xylene, ethylbenzene, toluene, total lead, ethylene dibromide and ethylene dichloride in accordance with CCR, Title 22, Section 64403; and

- b) Assure that a pure, wholesome and potable water is continuously supplied to the users in the Julian Communities Services District in accordance with CCR, Title 22, Section 64403.

The dischargers shall notify the Regional Board Executive Officer and the County of San Diego Environmental Health Services Land Use and Site Assessment and Mitigation Unit in writing, by registered mail, of all instances where water supplied to any user by the Julian Communities Services District exceeded the applicable primary drinking water MCL's for benzene, xylene, ethylbenzene, toluene, total lead, ethylene dibromide and ethylene dichloride. The notification shall take place as soon as the discharger(s) have knowledge of the violation and notification is possible.

2. The dischargers shall take interim remedial actions, as necessary, to abate or correct the actual or potential effects of the discharge. Interim remedial actions can occur concurrently with any phase of corrective action. The discharger shall submit a work plan by April 1, 1993 as required under Directive 12 describing the initial immediate interim remedial actions that will be undertaken. Interim remedial actions include, but are not limited to, the following:
  - a) Removal of free product. Free product removal must comply with the applicable provisions of Section 2655, Article 5, Chapter 16, Division 3, Title 23, California Code of Regulations;
  - b) Enhanced biodegradation to promote bacterial decomposition of contaminants;
  - c) Excavation and disposal of contaminated soil;
  - d) Excavation and treatment of contaminated soil;
  - e) Vacuum extraction of contaminants from soil or ground water;
  - f) Pumping and treatment of ground water to remove dissolved contaminants; and
  - g) Provision of appropriate water supply treatment facilities or an alternative water supply for water users in the Julian Community Services District.

3. The dischargers shall submit a Corrective Action Plan by July 1, 1993 containing the elements listed below. The discharger shall file a work plan as required by Directive 12 by April 1, 1993 describing the work that will be undertaken to develop the Corrective Action Plan.
  - a) An assessment of the impacts listed in Directive 4 of this Order; and
  - b) A feasibility study containing the information described in Directive 4 of this Order.
4. The assessment of impacts study described in Directive ~~7a~~<sup>3</sup> shall contain the following information:
  - a) Ground Water Impact Assessment
    - 1) The physical and chemical characteristics of the substance discharged, including its toxicity, persistence and potential for migration in water, soil and air;
    - 2) The results of a soil and water investigation, including the collection and analysis of data necessary, to assess the nature and vertical and lateral extent of the discharge. Determine the spatial distribution of and concentration of each constituent of concern throughout the zone affected by the release;
    - 3) The hydrogeological characteristics of the site and the surrounding area where the discharge has migrated or may migrate;
    - 4) The proximity and quality of nearby ground water and the current and potential beneficial uses of these waters. The results of a ground water user survey describing the location of all wells which have been or may be affected by the discharge, the names and addresses of the well owners, and the use and withdrawal rate of the well, shall be included;
    - 5) The quantity of ground water and the direction of flow;
    - 6) The existing quality of ground water, including other sources of contamination or pollution and their cumulative impact on ground water quality;

- 7) The potential for health effects caused by human exposure to the waste constituents;
- 8) The potential damage to wildlife, crops, vegetation and physical structures caused by exposure to waste constituents; and
- 9) The persistence and permanence of the adverse effects.

b) Surface Water Impact Assessment

- 1) The physical and chemical characteristics of the substance discharged, including its toxicity, persistence and potential for migration in water, soil and air;
- 2) The hydrogeological characteristics of the site and the surrounding area where the discharge has migrated or may migrate;
- 3) The quantity of ground water and the direction of flow;
- 4) The patterns of precipitation in the region;
- 5) The proximity of the discharge plume to surface waters;
- 6) The current and potential future uses of surface waters in the area;
- 7) The existing quality of surface water including other sources of contamination or pollution and the cumulative impact on surface water quality;
- 8) The potential for health effects caused by human exposure to the waste constituents;
- 9) The potential damage to wildlife, crops, vegetation and physical structures caused by exposure to waste constituents; and
- 10) The persistence and permanence of the adverse effects.

5. The feasibility study described in Directive 3b shall contain an evaluation of alternatives for cleanup of soil

and ground water. The evaluation shall include the following elements:

- a) An evaluation of the effectiveness, feasibility and cost of at least two alternatives to attain background ground water quality for the following constituents:

Constituents

Total Petroleum Hydrocarbons  
Benzene  
Toluene  
Total xylenes  
Ethylbenzene  
Total lead  
Ethylene dibromide  
Ethylene dichloride

- b) An evaluation of the effectiveness, feasibility and cost of at least two alternatives to attain the following primary and proposed secondary MCL ground water quality cleanup levels:

Constituents

Cleanup Level

Total Petroleum Hydrocarbons	5	µg/l
Benzene	1	µg/l
Toluene	42	µg/l
Total xylenes	17	µg/l
Ethylbenzene	29	µg/l
Ethylene dibromide	0.02	µg/l
Ethylene dichloride	0.5	µg/l

- c) An evaluation of the effectiveness, feasibility and cost of at least two alternatives to attain the following primary MCL ground water quality cleanup levels:

Constituents

Cleanup Level

Benzene	1	µg/l
Toluene	1000	µg/l
Total xylenes	1750	µg/l
Ethylbenzene	680	µg/l
Total lead	50	µg/l
Ethylene dibromide	0.02	µg/l
Ethylene dichloride	0.5	µg/l

- d) A comprehensive description of the cleanup and abatement activities associated with each alternative;
  - e) A proposed time schedule, including interim milestone dates for completion of each alternative;
  - f) A recommended cleanup alternative for each cleanup level and a commitment to implement the recommended alternative;
  - g) In developing the cleanup alternatives the dischargers shall consider the following cleanup and abatement methods or combinations thereof, to the extent that they may be applicable to the discharge or threat thereof;
    - A. Source removal and/or isolation;
    - B. In-place treatment of soil and water;
    - C. Bioremediation;
    - D. Aeration;
    - E. Fixation;
    - F. Excavation or extraction of soil, water, or gas for on-site or off-site treatment by the following techniques:
      - 1. Bioremediation;
      - 2. Thermal destruction;
      - 3. Aeration;
      - 4. Sorption;
      - 5. Precipitation, flocculation, and sedimentation;
      - 6. Filtration;
      - 7. Fixation;
      - 8. Evaporation
  - h) Excavation or extraction of soil, water, or gas for appropriate recycling, re-use, or disposal.
6. Based upon review of the Corrective Action Plan the Regional Board Executive Officer will amend this cleanup and abatement order to identify the final ground water and soil cleanup levels to be attained at the site and an appropriate compliance time schedule. The dischargers shall begin implementation of the appropriate Corrective Action Plan alternative within 60 days of receipt of the amended cleanup and abatement order. The dischargers shall modify the Corrective Action Plan alternative as required by the Regional Board Executive Officer. The dischargers shall

complete implementation of the Corrective Action Plan to attain the ground water and soil cleanup levels designated in the amended cleanup and abatement order by April 1, 1995. Before implementation of the cleanup alternative the dischargers shall:

- a) Notify the Regional Board Executive Officer in writing by registered mail of its intention to begin cleanup in accordance with the approved Corrective Action Plan alternative;
  - b) Comply with any conditions set by the Regional Board Executive Office, including mitigation of any adverse consequences from cleanup activities; and
  - c) Submit a health and safety plan for the approved Corrective Action Plan alternative.
7. The discharger shall submit a Water Quality Monitoring Program by July 1, 1993 to demonstrate the effectiveness of the Corrective Action Plan. The discharger shall file a work plan as required by Directive 12 by April 1, 1993 describing the work that will be undertaken to develop the Water Quality Monitoring Plan. The Water Quality Monitoring Plan shall address and/or conform to the following criteria:
- Monitoring Wells:
- a) All monitoring wells for the Water Quality Monitoring Program shall be designed and certified by a registered geologist or civil engineer.
  - b) All monitoring wells and all other borings drilled to satisfy the Water Quality Monitoring Program shall be logged during drilling under the direct supervision of a registered geologist. The drilling logs shall be submitted to the Regional Board Executive Officer upon completion of drilling. Copies of all drillers' logs which the Department of Water Resources requires to be submitted under Water Code Section 13751 shall be submitted to the Regional Board Executive Officer.
  - c) Soil shall be described in the geologic log according to the Unified Soil Classification System as presented in Geotechnical Branch Training Manuals Nos. 4, 5, and 6, published by the United States Bureau of Reclamation in January of 1986 (available from Bureau of Reclamation, Engineering and Research Center, Attention: Code D-7923, P.O. Box 25007, Denver,

Colorado 80225).

- d) Rock shall be described in the geologic log in a manner appropriate for the investigation.
- e) The Water Quality Monitoring Program shall include a sufficient number of background monitoring points installed at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water that has not been affected by the discharge.
- f) The Water Quality Monitoring Program shall include a sufficient number of monitoring points installed at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water passing the point of compliance and at other locations in the uppermost aquifer to provide the data needed to evaluate changes in water quality due to the discharge and the effectiveness of the Corrective Action Plan.
- g) The Water Quality Monitoring Program shall include a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield ground water samples from portions of the zone of saturation, including other aquifers not monitored pursuant to Item f above, to provide the data needed to evaluate changes in water quality due to the discharge and the effectiveness of the Corrective Action Plan.
- h) The Water Quality Monitoring Program shall include a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield ground water samples from zones of perched water to provide the data needed to evaluate changes in water quality due to the effectiveness of the Corrective Action Plan.
- i) The background monitoring points may include points that are not hydraulically upgradient from the site if the discharger demonstrates to the satisfaction of the Regional Board Executive Officer that sampling at other monitoring points will provide samples that are representative of the background quality of ground water or are more representative than those provided by the upgradient monitoring points.

- j) All monitoring wells shall be cased and constructed in a manner that maintains the integrity of the monitoring well bore hole and prevents the bore hole from acting as a conduit for contaminant transport.
- k) The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative ground water samples.
- l) For each monitoring well, the annular space (i.e., the space between the bore hole and well casing) above and below the sampling interval shall be appropriately sealed to prevent entry of contaminants from the ground surface, entry of contaminants from the unsaturated zone, cross contamination between portions of the zone of saturation, and contamination of samples.
- m) Where possible, the depth and thickness of saturated zones shall be included in the geologic log.

Water Quality Sampling:

- n) The Water Quality Monitoring Program shall include consistent sampling and analytical procedures that are designed to ensure that monitoring results provide a reliable indication of water quality at all monitoring points and background monitoring points. At a minimum the program shall include a detailed description of the procedures and techniques for:
  - 1) Sample collection (e.g. purging techniques, sampling equipment, and decontamination of sampling equipment);
  - 2) sample preservation and shipment;
  - 3) analytical procedures; and
  - 4) chain of custody control.
- o) The Water Quality Monitoring Program shall include appropriate sampling and analytical methods for ground water, surface water, and the unsaturated zone that accurately measure the concentration of each constituent of concern and the concentration or value of each monitoring parameter.

- p) Ground water sampling shall be scheduled to include the times of expected highest and lowest elevation of the potentiometric surface. The sampling method shall assure to the greatest extent possible that independent samples are obtained. In addition to any pre-sampling purge prescribed in the sampling and analysis plan, ground water monitoring wells shall be purged immediately after sampling is completed in order to remove all residual water that was in the well bore during the sampling event so as to assure the independence of samples from successive sampling events. The volume of water to be withdrawn from the well bore for the post sampling purge shall be determined by the same method used to determine adequate pre-sampling purging;
- q) A sequence of at least four samples for total petroleum hydrocarbons, benzene, toluene, total xylenes, ethylbenzene, total lead, and ethylene dibromide shall be collected from each monitoring point and background monitoring point on a quarterly basis;
- r) All monitoring wells shall be adequately developed to enable a collection of representative ground water samples.
- s) The ground water portion of the Water Quality Monitoring Program shall include an accurate determination of the ground water elevation and field parameters (temperature, electrical conductivity, turbidity and Ph) at each well each time ground water is sampled.
- t) The discharger shall measure the water level in each well and determine ground water flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored at least quarterly, including the times of expected highest and lowest elevations of the water levels in the wells.
- u) Graphs of all analytical data, from each monitoring point and background monitoring point shall be submitted. Graphs shall be at a scale appropriate to show trends or variations in water quality. All graphs for a given constituent shall be plotted on the same scale to facilitate visual comparison of monitoring data. Unless the discharger receives written approval from the Regional Board Executive Officer to use an

alternate procedure that more effectively illustrates trends or variations in the data, each graph shall represent data from one monitoring point or background monitoring point and one constituent of concern.

- v) The Water Quality Monitoring Program shall include a proposed statistical procedure to be used for evaluating water quality monitoring data. The specifications for the statistical method shall include a detailed description of the criteria to be used for determining statistically significant evidence of the effectiveness of the Corrective Action Plan.

#### Surface Water

- w) The Water Quality Monitoring Program must also establish a surface water monitoring system for all surface water that could be affected by the discharge. The surface water monitoring system must include:
- 1) A sufficient number of background monitoring points established at appropriate locations and depths to yield samples from each surface water body that represents the quality of surface water that has not been affected by the discharge;
  - 2) A sufficient number of monitoring points established at appropriate locations and depths to yield samples from each surface water body that provide data to evaluate the effectiveness of the corrective action program.

8. The dischargers shall implement the Water Quality Monitoring Program required under Directive 61 by August 1, 1993 unless the dischargers are directed otherwise by the Regional Board Executive Officer. The dischargers shall modify the Water Quality Monitoring Program as required by the Regional Board Executive Officer. Before implementation of the Water Quality Monitoring Plan the dischargers shall:

- a) Notify the Regional Board Executive Officer in writing by registered mail of its intention to begin cleanup in accordance with the approved Corrective Action Plan alternative; and
- b) Comply with any conditions set by the Regional Board Executive Officer, including mitigation of any adverse consequences from cleanup activities.

9. The dischargers shall submit quarterly progress reports on the implementation of the Corrective Action Plan containing the following information:
- a) Water quality sample results for total petroleum hydrocarbons, benzene, toluene, total xylenes, ethylbenzene, total lead, ethylene dibromide and ethylene dichloride from monitoring locations designated in the Water Quality Monitoring Program approved by the Regional Board Executive Officer.
  - b) Graphs of all analytical data, from each monitoring point and background monitoring point shall be submitted. Graphs shall be at a scale appropriate to show trends or variations in water quality. All graphs for a given constituent shall be plotted on the same scale to facilitate visual comparison of monitoring data. Unless the discharger receives written approval from the Regional Board Executive Officer to use an alternate procedure that more effectively illustrates trends or variations in the data, each graph shall represent data from one monitoring point or background monitoring point and one constituent of concern.
  - c) A statistical evaluation of the water quality monitoring results;
  - d) A map of the site showing all monitoring locations; and
  - e) A detailed discussion of the progress in implementation of the Corrective Action Plan.

The dischargers shall submit the quarterly progress reports to the Regional Board in accordance with the following reporting schedule:

<u>Reporting Period</u>	<u>Report Due</u>
January, February, March	April 30
April, May, June	July 30
July, August, September	October 30
October, November, December	January 30

10. The dischargers shall submit a proposed Verification Monitoring Program by December 1, 1994. The dischargers shall verify completion of the Corrective Action Plan and the attainment of the cleanup level prescribed in Directive 1 through sampling of ground water at intervals and location and for constituents agreed to by the Regional Board Executive Officer. The dischargers shall submit

verification monitoring data and an evaluation of the results of such monitoring on a schedule and for a duration agreed to by the Regional Board Executive Officer. Upon completion of the verification monitoring program the Regional Board Executive Officer will inform the discharger in writing that no further work is required at that time, based on the available information and rescind this cleanup and abatement order. This written notice will constitute Regional Board concurrence on the completed corrective action.

11. The dischargers shall dispose of contaminated soil and ground water in accordance with applicable federal, state and local regulations.
12. Before taking the actions described in Directives 2, 3, 4, 5, 7 and 10 the dischargers shall submit a work plan describing the proposed actions and a proposed schedule for their completion. The dischargers shall modify the work plan as directed by the Regional Board Executive Officer. In the interest of minimizing environmental contamination and promoting prompt cleanup, the dischargers may begin implementation of the proposed actions after the work plan has been submitted and before it has received Regional Board Executive Officer concurrence. Implementation of the work plan shall begin no later than sixty (60) calendar days after submittal, unless the dischargers are directed otherwise by the Regional Board Executive Officer. Before beginning the activities described in the work plan the dischargers shall:
  - a) Notify the Regional Board Executive Officer in writing by registered mail of the intent to initiate the proposed actions included in the work plan submitted; and
  - b) Comply with any conditions set by the Regional Board Executive Officer, including mitigation of adverse consequences from cleanup activities.
- 13) The dischargers shall ensure that:
  - a) All plans and reports required under this cleanup and abatement order are prepared by professionals qualified to prepare such reports. Professionals should be qualified, licensed where applicable, and competent and proficient in the fields pertinent to the required activities. California Business and Professions Code Sections 6735, 7835, and 7835.1 require that

engineering and geologic evaluations and judgements be performed by or under the direction of registered professionals.

- b) All components of investigative and cleanup and abatement actions required under this order are conducted under the direction of appropriately qualified professionals.
- c) A statement of qualifications of the responsible lead professionals shall be included in all plans and reports submitted to the Regional Board. Plans and reports which do not contain this statement will be deemed incomplete by the Regional Board Executive Officer for the purpose of compliance with this cleanup and abatement order.

PROVISIONS

1. Pursuant to Section 13304 of the Water Code, the dischargers are hereby notified that the Regional Board is entitled to, and will, seek reimbursement for all reasonable costs actually incurred by the Regional Board staff to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action required by this cleanup and abatement order. Reimbursable costs are costs incurred by the Regional Board following March 15, 1993. Upon receipt of a billing statement for such costs, the discharger(s) shall reimburse the Regional Board.
2. Failure to submit technical reports required under this Cleanup and Abatement Order may result in the imposition of civil liabilities, under California Water Code section 13350(d), in an amount not to exceed fifteen thousand dollars (\$15,000) for each day in which the violation occurs.
3. The dischargers shall send copies of all reports required under this cleanup and abatement order to the County of San Diego Environmental Health Services Site Assessment and Mitigation Unit.



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ARTHUR L. COE  
Executive Officer

Date issued: April 1, 1993