CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER 91 - 125
WASTE DISCHARGE REQUIREMENTS

CHEVRON LAND AND DEVELOPMENT COMPANY,
CHEVRON U.S.A., INC.
3260 BLUME DRIVE
CITY OF RICHMOND
CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board) finds that:

1. Location and Site Description. Chevron Land and Development Company (hereinafter called the discharger), owns and intends to develop a 310 acre site for residential, commercial and industrial use, at Hilltop West, in the City of Richmond, in the County of Contra Costa near Pt. Pinole as shown in Figure 1. The site is bordered by: San Pablo Avenue on the east; Chevron Chemical Company's laboratory facility and Chevron's Environmental Health Center on the southeast; Montalvin Manor residential area to the northeast; Giant Road and the Richmond Country Club on the west; and the Leroy Heights residential area on the south. The site, formerly owned by Chevron U.S.A. Inc., once served Chevron U.S.A., Inc.'s Richmond Refinery as the western portion of the 800 acre San Pablo Tank Farm.

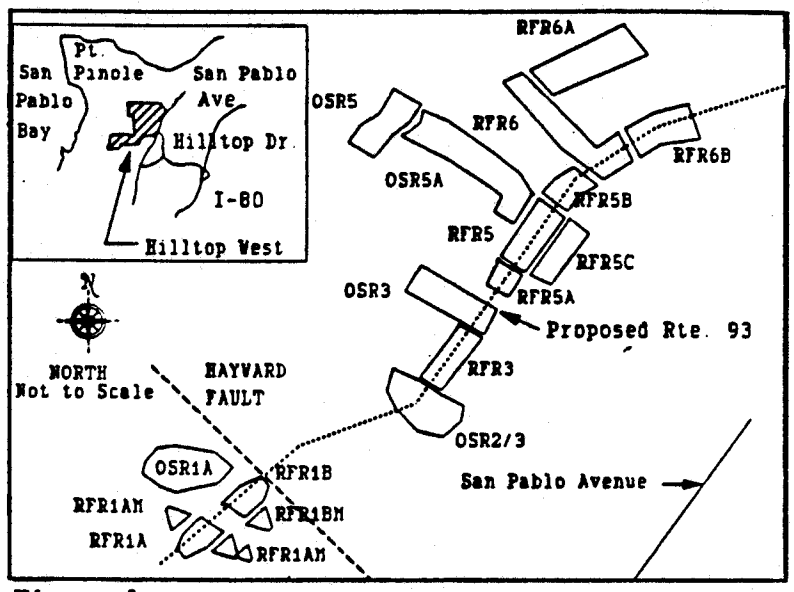


Figure 1
Location Map and Site Map Showing Location of Open Space Oily Soil Repositories (OSRs) and Road Fill Repositories (RFRs)

2. Site History. Petroleum storage tanks were first constructed on site around 1915. Ultimately, forty-five 100-foot-diameter, surface-mounted, metal, product tanks, a number of pipelines and four pump stations managed crude oil, gas oil, gasoline and its intermediates, and diesel fuel. The site was contaminated by petroleum hydrocarbons while the site was operated as a tank farm. Beginning in the mid-1970s and ending in the early 1980s, the tanks were drained and dismantled. The discharger proposed a remedial action plan[1] to move 1.2 million cubic yards of oily soil into eight repositories. During most of 1988 and early in 1989, the discharger constructed repositories under proposed roadways and open space areas at the site. The actual volumes of oily soil were much greater than discussed in the remedial action plan. A study[2] indicates a total of 2.7 million cubic yards of oily soil was moved into 13 repositories (Area 1 is one repository). In accordance with the remedial action plan, soil with total petroleum hydrocarbons or total oil and grease of less than 1,000 mg/kg were excavated for use in other locations as fill. In an internal memorandum[3], county officials recalculated the human risk assessment for exposure to soil contaminated with total petroleum

hydrocarbons. The recalculation, based on a new state criteria for benzene, determined that the acceptable soil concentration of total petroleum hydrocarbon is 675 mg/kg or total oil and grease is 1,000 mg/kg. The discharger claims that the recalculation was too conservative and that the criteria in the remedial action plan is satisfactory. The discharger has placed about 0.5 million cubic yards of oily soils into temporary stockpiles. The stockpiles were not proposed in the remedial action plan.

3. Hydrogeology. The Hayward Fault, which crosses the western edge of the site, appears to act as a ground water divide and is a dominant hydrogeologic feature. The natural contours have been altered considerably. During use as a tank farm, artificial fills were extensively used throughout the site. Numerous embankments, ponds, roadways, berms and ponds were constructed as structural foundations and surface-water/oil containment structures. Oily soils were apparently spread over several hillsides. Old impoundments were backfilled and regraded. During recent development, site grading, involving about 7.5 million cubic yards of soil, has further changed the natural contours.

a. Southwest of the Hayward Fault. In this portion of the site, several hundred feet of unconsolidated alluvial silty and clayey sands overlay the bedrock. A study[4] reported two layers of silty clay of undefined horizontal extent, one in the upper 5 feet and another beginning at about 35 feet, are separated by sandy gravel material. Ground water was at 30 feet below the ground surface and appeared unconfined. In another study[5] several inplace permeability measurements were made at depths of 5 to 8 feet. The estimated the horizontal hydraulic permeability varied from 5.2×10^{-3} cm/sec to $<3.0 \times 10^{-8}$ cm/sec.

b. Northeast of the Hayward Fault. Ninety-five percent of the site lies here, where colluvium of unconsolidated sandy and silty clays were once located in the original natural drainage courses and were partially removed and replaced with engineered fill. Terrace deposits of silty, clayey sand and rounded gravel range in depths up to 12 feet in areas of the site. The bedrock units present in this area consist of mudstone interlayered with sandstone, siltstone and pebble conglomerate. Ground water often occurs in the colluvium and the underlying formations. Two separate studies[6] reported field permeability measurements beneath the repositories as follows:

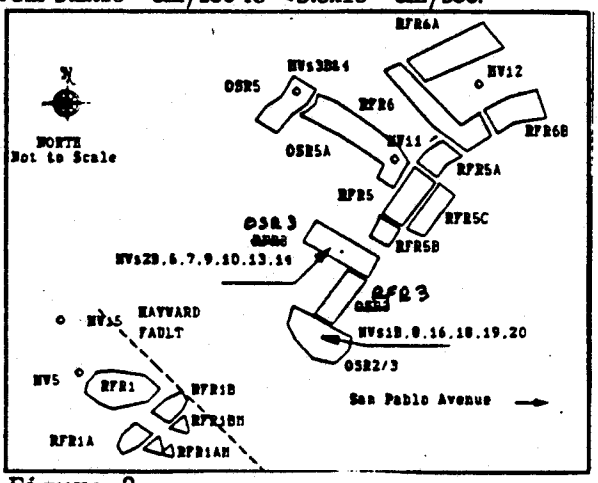


Figure 2
Historic Ground Water Monitoring Well Locations (Destroyed When the Repositories Were Built)

- OSR-2/3. The permeabilities of the underlying material varied from 6.0×10^{-4} cm/sec to 1.2×10^{-7} cm/sec. Much of the more permeable material may have been removed during the construction of the repository.
- OSR-3. The permeabilities of the underlying material varied from 1.5×10^{-3} cm/sec to 4.8×10^{-6} cm/sec.
- OSR-5A. Permeability of the underlying silty sand measured in MW-11 was 1.3×10^{-4} cm/sec.

4. Chemicals of Concern. Soil and ground water contamination consists of total petroleum hydrocarbons as gasoline, total petroleum hydrocarbons as diesel, total petroleum hydrocarbons as kerosene, total oil and grease, benzene, toluene, ethylbenzene, and xylene. Lead-contaminated soil found near the storage tanks has been removed from the site.

5. Ground Water Contamination. Prior to the construction of the repositories and excavation of oily materials to stockpiles, the discharger[7,8] installed several ground water monitoring wells most in the sites of OSR-2/3 and OSR-3 as shown in Figure 2. The early wells were removed when the repositories were built. The discharger[9,10] has installed additional wells to monitor the ground water quality adjacent to the repositories. The wells are currently being monitored as shown in Figure 3. The discharger has analyzed hundreds of ground water samples. Ground water contamination has been detected at only a few locations.

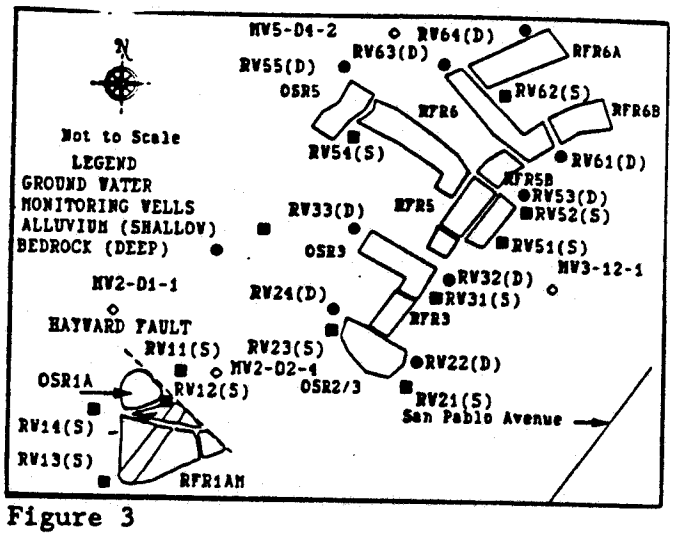


Figure 3
Location of Existing Ground Water Monitoring Wells Located in Shallow (S) and Deep (D) Formations.

a. Southwest of the Hayward Fault. A report[11] discussed four additional wells installed to monitor the uppermost water bearing zone. Ground water contamination was detected primarily in downgradient well RW-13. The well screen for RW-13 was installed from 19 to 28 feet depth in clay and silty sand. The entire boring encountered clay interbedded with sandy silt and silty sand. The depth to water has been about 15 feet. RW-13 has detected total petroleum hydrocarbons as gasoline as high as 0.4 mg/l, total petroleum hydrocarbons as diesel as high as 0.85 mg/l, total petroleum hydrocarbons as kerosene as high as 0.39 mg/l, 0.7 ug/l benzene, toluene as high as 0.6 ug/l, 3.9 ug/l ethylbenzene, xylene as high as 2.6 ug/l. Many of the highest concentrations were detected at the time of well construction. Since then, contamination has not been consistently present.

b. Northeast of the Hayward Fault. A study[12] reported ground water contamination as follows:

- OSR-2/3. 1.1 mg/l barium and 0.2 mg/l nickel, total petroleum hydrocarbons as diesel as high as 1,100 mg/l and total petroleum hydrocarbons as kerosene as high as 220 mg/l, benzene as high as 420 ug/l, toluene as high as 240 ug/l, ethylbenzene as high as 110 ug/l were found in MW-8; 1.2 mg/l barium in MW-16; 0.03 mg/l antimony in MW-19 and; 0.05 mg/l selenium in MW-20. The discharger claims that excavation to mudstone occurred prior to construction of the repository. The wells in this location were screened in a shallow formation above the mudstone.

- OSR-3. Free liquid phase hydrocarbons were discovered during the construction of Well MW-6, free liquid phase hydrocarbons, benzene as high as 107 ug/l, toluene as high as 96 ug/l, and ethyl benzene as high as 134 ug/l were discovered in MW-6, 0.1 mg/l Barium in MW-14, naphthalene as high as 40 ug/l and toluene as high as 7 ug/l was found in MW-7, 3 ug/l toluene in MW-13, and 0.2 mg/l barium in MW-9. The discharger claims that excavation to mudstone occurred prior to construction of the repository. Many of the wells in this location were screened in deep (20 to 50 feet depth) formations of the sandstone, conglomerate and mudstone.

Another study[13] stated:

- RFR6. Traces of total petroleum hydrocarbons as diesel were detected in MW-11.

Total petroleum hydrocarbons as gasoline has been detected as high as 0.8 mg/l, total petroleum hydrocarbons as diesel as high as 0.7 mg/l, total petroleum hydrocarbons as kerosene as high as 0.5 mg/l in RW-64.

In another study[14], a model evaluation of the repositories estimated that leachate would be generated at some repositories within six years. Further studies[15] concluded that the previous model was flawed and a more appropriate model was used to demonstrate that leachate will still be generated although in significantly less quantities.

6. Soil Contamination.

a. Repositories. A study[16] summarized the volume of oily soils that were placed in repositories. About 19% of the volume of the oily soil in the repositories have total petroleum hydrocarbons concentrations in excess of 1,000 mg/kg. About 31% of the volume of the oily soil in the repositories have total oil and grease concentrations in excess of 1,000 mg/kg. Two additional reports[17] summarized oily soil contaminants, which ended in a repository, as follows:

- Benzene was detected in 5 out of 37 samples in concentrations as high as 6,200 ug/kg;
- Toluene was detected in 1 out of 37 samples at 14,000 ug/kg;
- Ethylbenzene was detected in 9 out of 37 samples in concentrations as high as 46,000 ug/kg;
- Chlorobenzene was detected in 2 out of 37 samples in concentrations as high as 10,600 ug/kg;
- Xylene was detected in 14 out of 37 samples in concentrations as high as 183,000 ug/kg;
- Total petroleum hydrocarbons as diesel was detected in 43% of 600 samples in concentrations as high as 50,560 mg/kg;
- Total petroleum hydrocarbons as kerosene was detected in 43% of 600 samples in concentrations as high as 11,600 mg/kg;
- Total petroleum hydrocarbons as gasoline was detected in 43% of 600 samples in concentrations as high as 4,300 mg/kg, and;
- Total oil and grease was detected in 81% of 600 samples in concentrations as high as 482,750 mg/kg.

b. Remaining in Place Oily Soils. Locations of remaining in place oily soils are shown in Figure 4.

i. Southwest of the Hayward Fault. A study[18] reported soil contamination as high as the following:

- Total petroleum hydrocarbons as diesel 1,700 mg/kg;
- Total petroleum hydrocarbons as kerosene 4,200 mg/kg;
- Total petroleum hydrocarbons as gasoline 4,300 mg/kg;
- Total oil and grease 4,080 mg/kg;

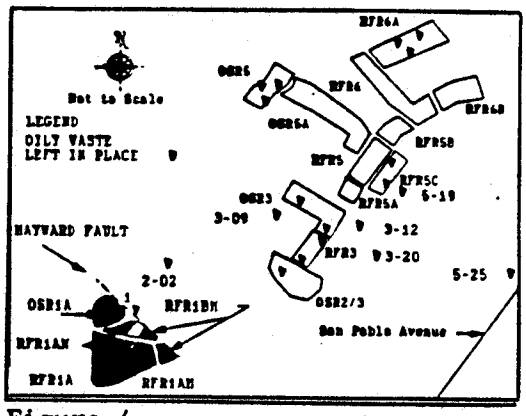


Figure 4
Locations of oily soil remaining in place

- Total oil and grease 4,080 mg/kg;
- Napthaline 68 mg/kg;
- Phenanthrene 5.3 mg/kg, and;
- Pyrene 8.2 mg/kg.

ii. Northeast of the Hayward Fault.

(1) Beneath Lined Oily Soil Repositories. A report[19] states that oily soil may exist below the many of the repositories with concentrations in excess of 200 mg/kg total petroleum hydrocarbons and/or 500 mg/kg total oil and grease in volumes that vary from 130 to 11,800 cubic yards. The volume estimates are not based on analytical tests but are based on sensory clues (primarily air emissions). The actual volumes may be considerably different from that shown. Remaining in place oily soils beneath repositories OSR-2/3, RFR-6, and RFR-6A are believed to be in contact with ground water. Remaining in place oily soil beneath OSR-3 is believed to be separated from ground water by about 10 feet.

(2) Other Locations. After construction of the repositories and the stockpiles, areas of oily soil remained in place. These oily soil areas were identified by visual staining, organic vapor indicators, and analytical analyses. In a report[20], thirty one areas with oily soil were summarized. Twenty two of the areas were found to have measurable quantities of oily soil; about 212,000 cubic yards in total. Approximately 30,340 cubic yards is estimated to have total petroleum hydrocarbons and total oil and grease above 1,000 mg/kg. Many of the areas of oily soil will not impact ground water quality since they are separated from ground water by many feet of bedrock and are covered by feet of imported fill. The discharger believes that only Area 5-04 will impact ground water quality and proposes to excavate Area 5-04 for use as roadway base material. Further analysis is required to determine whether additional areas also require remediation. There are other areas that contain significant amounts of oily soil with a potential for impacting ground water quality, such as the following:

Area 3-12: This area had the largest estimated volume of oily soil, which extended to a depth of about 35 ft. The oily soil is in contact with ground water and will be covered with 10 feet of fill in a proposed commercial development. Benzene as high as 17 mg/kg, toluene as high as 41 mg/kg, ethylbenzene as high as 37 mg/kg, xylene as high as 140 mg/kg, total petroleum hydrocarbons as gasoline as high as 7,400 mg/kg and total oil and grease as high as 26,000 mg/kg were identified in the oily soil. Initially, MW-3-12-1 detected total petroleum hydrocarbons between 0.15 and 0.21 mg/l, benzene between 0.9 and 1.3 ug/l. It is estimated that 14,000 cubic yards of soil with total petroleum hydrocarbons and total oil and grease in excess of 1,000 mg/kg exists here.

Area 3-20: The oily soil in this area is separated from ground water by 28 feet of mudstone and construction restraints at the property line and sewer line would make excavation difficult. In this area, the highest concentration of total oil and grease was 54,000 mg/kg; total petroleum hydrocarbons as gasoline was 7,000 mg/kg and; benzene as high as 2.3 mg/kg. It is estimated that 470 cubic yards of soil with total petroleum hydrocarbons and total oil and grease in excess of 1,000 mg/kg exists here.

c. Stockpiles. After the construction of the repositories, additional areas of oily soil were identified. The additional oily soil areas were excavated and three stockpiles were created on the site. The total volume of oily soil in the three stockpiles is about 0.5 million cubic yards. In March 1989 the discharger obtained an initial 50 randomly located soil samples from the stockpiled material, or about one sample for 10,000 cubic yards. The limited sampling reports total petroleum hydrocarbons as diesel as high as 3,200 mg/kg and total oil and grease as high as 4,700 mg/kg. Detectable concentrations of total petroleum hydrocarbons were identified in about one-fourth of the samples and detectable concentrations of total oil and grease were identified in about all of the samples. Detectable concentrations of benzene, toluene, ethylbenzene, and xylene were detected in about 20% of the samples, and the majority of the concentrations were much less than the highest concentration. In 1991 the discharger conducted a pilot study to determine how efficiently the stockpiled material can be separated. In the study the discharger separated about 10,525 cubic yards of stockpile material into 3,200 cubic yards of oily soil and 7,350 cubic yards of "clean" soil. The discharger states that about 70 percent of the sample and possibly the stockpiled material is not "clean soil". The discharger defined "clean soil" as soil with contaminates less than the following:

- Total Oil and Grease - 500 mg/kg;
- Total Petroleum Hydrocarbon - 200 mg/kg;
- Benzene - 5 ug/kg;
- Toluene - 10 mg/kg;
- Xylene - 10 mg/kg, and;
- Ethylbenzene - 10 mg/kg.

d. Background: In a study[21], the characterization of background soil. The discharger reported that background soil samples exhibited detectable total oil and grease levels measured by the gravimetric method, used on site prior to 1990. None of the background soil samples exhibited detectable concentrations of total petroleum hydrocarbons or total oil and grease (infrared method).

7. Classified Waste Management Units. All repositories contain designated waste and are classified as Class II waste management units and the appropriate standards as described in Chapter 15, Article 3, Title 23 of the California Code of Regulations shall apply. Alternatives to the standards shall be considered only when the discharger has demonstrated that the standards are unreasonable and unnecessarily burdensome and will cost substantially more. In addition, the alternative standard shall be a specific engineered alternative that is consistent with the goal of the standard and affords equivalent protection against water quality impairment. The repositories have not met the standards for engineered liners, leachate collection and removal systems, separation to ground water and setback from an active holocene fault. The discharger's remedial action plan demonstrated that strict compliance with Class II standards was economically burdensome (about $55 million) but failed to accurately describe the volume of oily soil, the number of repositories and the protection of the ground water quality. The discharger proposes[22] to continue to monitor the entire site at a cost of $36,900 annually. This is not an acceptable alternative to the standard of a Class II waste management unit for most of the repositories. In addition there are several pipeline corridors, that cross over and through repositories. These pose a threat to the repositories due to leaking or maintenance.

a. Area 1. Repositories southwesterly of the Hayward fault were constructed on top of oily soil and without engineered liners or leachate collection and removal system and less than a 200 foot setback from the Hayward Fault. A study[23] reports that the naturally occurring clay soil below all but one of the repositories (OSR-1A) is equivalent to an engineered liner. Another report[24] states that oily soils were observed to a maximum depth of 26 feet, while the water table is deeper, 29 feet. However it is possible (although not discovered) that hydrocarbons could migrate to ground water via fractures, and thus go undetected in the soils immediately

above. One study[25] reports that:

- The use of underlying clay layers 5 to 10 feet below the original grade is questionable as portions of the layer consist of already contaminated oily soil and its continuity is unknown, and;

- The use of saturated clay layers approximately 35 feet below the original grade is questionable because ground water was encountered approximately 10 feet above this clay layer and its continuity is unknown.

The discharger has demonstrated that excavation of the remaining in place contaminated soils as well as the unlined repositories (a total of 360,000 cubic yards) for disposal into an onsite Class II waste management unit that is 200 feet from the active Hayward Fault is economically burdensome. An acceptable alternative may be installation of a ground water extraction system. The system would be in place and ready to be operated if ground water quality standards are exceeded. Additional measures, such as a ground water cutoff wall, may be required in the event that the extraction wells are ineffectual. A Post Earthquake Inspection and Corrective Action Plan will be important at this as well as the other waste management units.

b. OSR-2/3. This repository was constructed with only a one foot thick clay liner, without a leachate collection and removal system, over possibly contaminated soil and ground water. There is less than 5 foot separation between the bottom of the repository and the estimated potentiometric level of the ground water. This is an open space repository and leachate may be generated. The estimated cost of rebuilding the repository to Class II standards is economically burdensome. An acceptable alternative may be installation of a ground water extraction system. The system would be in place and ready to be operated if ground water quality standards are exceeded. Additional measures, such as ground water drawdown, may be required in the event that the extraction wells are ineffectual.

c. RFR-2/3. This repository was constructed without a leachate collection and removal system and over contaminated soil. The estimated cost of rebuilding the repository to Class II standards is economically burdensome. An acceptable alternative may be continued ground water monitoring, an appropriate closure fund and an appropriate post closure maintenance plan.

d. OSR-3. This repository was constructed with only a one foot thick clay liner (2 foot thick in the roadway section), without a leachate collection and removal system, over contaminated soil and ground water, and with less than 5 feet separation from underlying ground water. This is an open space repository and leachate may be generated. The estimated cost of rebuilding the repository to Class II standards is economically burdensome. An acceptable alternative may be installation of a ground water extraction system. The system would be in place and ready to be operated if ground water quality standards are exceeded. Additional measures, such as ground water drawdown, may be required in the event that the extraction wells are ineffectual.

e. RFR-5, RFR-5A, RFR-5B. These repositories were constructed without a leachate collection and removal system. RFR-5 has only a 1 foot thick liner. An acceptable alternative may be continued ground water monitoring, an appropriate closure fund and an appropriate post closure maintenance plan.

f. RFR-5C. This repository was constructed without a leachate collection and removal system. RFR-5C was constructed adjacent to oily soil and may not have adequate ground water separation, in addition it is an open space repository and leachate may be generated. There is

less than 5 foot separation between the bottom of the repository and the estimated potentiometric level of the ground water.[26] The estimated cost of rebuilding the repositories to Class II standards is economically burdensome. An acceptable alternative may be installation of a ground water extraction system. The system would be in place and ready to be operated if ground water quality standards are exceeded. Additional measures, such as retrofitting a leachate collection and removal system, may be required in the event that the extraction wells are ineffectual.

g. OSR-5 and OSR-5A. These repositories were constructed without a leachate collection and removal system. OSR-5 was constructed over oily soil. These are open space repositories and leachate may be generated. The estimated cost of rebuilding the repositories to Class II standards is economically burdensome. An acceptable alternative may be installation of a ground water extraction system. The system would be in place and ready to be operated if ground water quality standards are exceeded. Additional measures, such as retrofitting a leachate collection and removal system, may be required in the event that the extraction wells are ineffectual.

h. RFR-6 and RFR-6A. These repositories were constructed without a leachate collection and removal system and over oily soil believed to be in contact with underlying ground water. RFR-6A and possibly RFR-6 was built over contaminated ground water. RFR-6A is an open space repository and may generate leachate in addition it may not have adequate separation to underlying ground water. The estimated cost of rebuilding the repositories to Class II standards is economically burdensome. An acceptable alternative may be installation of a ground water extraction system. The system would be in place and ready to be operated if ground water quality standards are exceeded. Additional measures, such as a ground water cutoff wall, may be required in the event that the extraction wells are ineffectual.

i. Remaining in Place Soils. Chapter 15 requires remaining in place oily soils with contaminants in concentrations to be a threat to waters of the State to be remediated or placed in approved waste management units. The discharger has identified one area 5-04 that poses a threat; there may be others as well. Further analysis is required to determine whether additional areas also require remediation.

j. Stockpiles - Chapter 15 requires waste to be placed in approved waste management units or an acceptable alternative. The discharger has proposed to segregate the stockpiled material, using the oily soil with the highest contaminants for roadway base and using the soil with minimal contaminants as fill. Much of the stockpiled material does not have detectable concentrations of contaminants and is suitable for fill. Further analysis is required to determine the acceptable contaminant concentrations for fill and roadbase.

8. Repository Boundaries. Contained within the 310 acre Hilltop west site are 13 repositories. The boundaries of each repository are shown on Parcel Map 762 - 90 recorded in the County of Contra Costa on February 12, 1991 in Book 151 at page 13 - 21. The map and information contained there in, have been supplied by the discharger at their request and have not been verified or warranted by this Regional Board.

9. Water Quality Goals. According to Section 2552, Chapter 15 background water quality shall be established as goals for the waste management units regulated by this Order. The background water quality is considered non detectable for total petroleum hydrocarbons, total oil and grease, and benzene, toluene, ethylbenzene, and xylene, according to test methods specified in the attached Self Monitoring Program.

10. Reference to Regulations. References to Chapter 15 are to Article 3, Title 23 of the California Code of Regulations.

11. Cost Reimbursement. The Board finds that the reasonable costs of the State Water Resources Control Board and the Regional Water Quality Control Board in the oversight of the cleanup activities required by this Order are to be reimbursed to the State by the discharger in accordance with Section 13304 of the Water Code.

12. Beneficial Uses.

a. Surface Waters. The existing and potential beneficial uses of central San Francisco Bay are:

(1) Industrial Process and Service Supply;
(2) Navigation;
(3) Water Contact Recreation;
(4) Non-Contact Recreation;
(5) Ocean Commercial and Sport Fishing;
(6) Wildlife Habitat;
(7) Preservation of Rare and Endangered Species;
(8) Fish Migration and Spawning;
(9) Shellfish Harvesting, and;
(10) Estuarine Habitat.

b. Ground Waters. Ground water at the site is not utilized for drinking water purposes. Five ground water wells are located near the site. Two are used as monitoring wells, one may soon be abandoned and two are reportedly shallow supplementary irrigation water wells installed during the drought and no longer in service but could be used in the future. The potential beneficial uses of the ground water in the area are:

a. Municipal Supply
b. Industrial Process and Service Supply
c. Agricultural Supply

13. Basin Plan. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on August 19, 1987. The Basin Plan contains water quality objectives and beneficial uses for San Francisco Bay and contiguous surface and ground water. This Order implements the water quality objectives for the central San Francisco Bay as stated in the Basin Plan.

14. California Environmental Quality Act. The discharger prepared an Environmental Impact Report for the project in 1980. The EIR addressed the potential degradation of surface water quality due to erosion and run-off from the site and described appropriate mitigation measures. A Negative Declaration was issued by the City of Richmond on the General Plan Amendment in 1985. A Mitigated Negative Declaration was issued for the Official Plan Line Amendment by the City of Richmond in 1988. The Board accepts these environmental documents and finds that this Order protects the water resources associated with the project.

15. Notification. The Board has notified the discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with the opportunity to submit their written views and recommendations.

16. Hearing. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, that the discharger or its agents, successors or assigns, in order to meet the provisions of Division 7 of the California Water Code, shall comply with the following:

A. PROHIBITIONS

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State of California is prohibited.

2. Further significant migration of pollutants through subsurface transport to waters of the State of California is prohibited.

3. Activities, associated with the subsurface investigation and site cleanup, that cause significant adverse migration of pollutants are prohibited.

B. SPECIFICATIONS

1. The storage, handling, treatment or disposal if ground water quality standards are exceeded of soil or ground water containing pollutants shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. The discharger shall carry out remedial action at the site in manner acceptable to the Executive Officer.

3. If ground water extraction and treatment is considered as an alternative, the feasibility of water reuse, reinjection, and disposal if ground water quality standards are exceeded to the sanitary sewer must be evaluated. Based on the Regional Board Resolution 88-160, the discharger shall optimize, with a goal of 100%, the reclamation or reuse of ground water extracted as a result of cleanup activities. The discharger shall not be found in violation of this Order if documented factors beyond the discharger's control prevent the discharger from attaining this goal, provided the discharger has made a good faith effort to attain this goal. If reuse or reinjection is part of a proposed alternative, an application for Site Cleanup Requirements may be required. If discharge to waters of the State is part of a proposed alternative, an application for an NPDES permit must be completed and submitted, and must include the evaluation of the feasibility of water reuse, reinjection, and disposal if ground water quality standards are exceeded to the sanitary sewer.

4. The discharger shall operate the waste management units so as not to cause a statistically significant difference to exist between water quality at the compliance points and Water Quality Protection Standards to be established for the following applicable parameters. The discharger shall establish water quality protection standards according to the requirements of this Order and Article 5 of Chapter 15 for the following minimum parameters:

   pH;
   Electrical conductivity;
   Total dissolved solids;
   Total petroleum hydrocarbons as gasoline;
   Total petroleum hydrocarbons as diesel;
   Total petroleum hydrocarbons as kerosene, and;
   Total oil and grease.

5. The concentrations of indicator parameters or waste constituents in waters passing thorough Points of Compliance, as defined in the Self Monitoring Program for each waste management unit attached herein, shall not exceed the Water Quality Protection Standards, established by the provisions of this Order.

C. PROVISIONS

1. The discharger shall, in a timely manner, submit work descriptions and draft technical reports to Board staff for all technical reports required in these Provisions. The discharger may be assessed monetary penalties for late or incomplete technical reports required by these Provisions.

2. The discharger shall reimburse the State Water Resources Control Board and the Regional Water Quality Control Board for their reasonable costs in the oversight of cleanup activities.

3. The discharger shall comply with the Prohibitions and Specifications above, in accordance with the following time schedule and tasks:

   a. Repositories. All repositories shall be Class II waste management units constructed in accordance with Chapter 15 standards or acceptable alternative standards. No pipeline corridors will be allowed without secondary containment, such as a conductor pipe.

      (1) The discharger shall submit a remediation plan for compliance with Chapter 15 standards or alternatives, acceptable to the Executive Officer.
      Report Due: No later than January 2, 1992.

      (2) The discharger shall submit certification of construction according to the remediation plan, acceptable to the Executive Officer.
      Report Due: No later than January 2, 1993.

   b. Remaining in Place Oily Soils. Remaining in place soil described in the findings shall be disposed as acceptable to the Executive Officer.

      (1) The discharger shall submit a remediation plan for compliance, acceptable to the Executive Officer.
      Report Due: No later than January 2, 1992.

      (2) The discharger shall submit certification of construction according to the remediation plan, acceptable to the Executive Officer.
      Report Due: No later than January 2, 1993.

   c. Stockpiles. Stockpiled oily soil described in the findings shall be disposed in an appropriate waste management unit or bioremediated as acceptable to the Executive Officer.

      (1) The discharger shall submit a remediation plan for compliance, acceptable to the Executive Officer.
      Report Due: No later than January 2, 1992.

      (2) The discharger shall submit certification of construction according to the remediation plan, acceptable to the Executive Officer.
      Report Due: No later than January 2, 1993.

   d. Post Earthquake Inspection and Corrective Action Plan. The discharger shall submit a detailed Post Earthquake Inspection and Corrective Action Plan to be implemented in the event of any earthquake generating ground shaking of Modified Mercalli Intensity V or greater at or near the waste management unit. The report shall describe the containment features, and ground water monitoring and leachate control facilities potentially impacted by the static and seismic deformations of the waste management unit. The plan shall provide for reporting of the post earthquake inspection to the Board within 18 hours of the occurrence of the earthquake. Immediately after an

earthquake event causing damage to the waste management unit structures, the corrective action plan shall be implemented and this Board shall be notified of any damage.
Report Due: No later than January 2, 1992.

e. Leachate Management Plan. The discharger shall submit a detailed Leachate Management Plan for the waste management unit. This plan shall estimate the quantity of leachate produced, the storage of leachate, and the ultimate disposal if ground water quality standards are exceeded of the leachate. The report shall evaluate the quantity of produced from the waste management unit and determine the maximum safe operating level for the leachate containment facilities. In addition, the plan shall provide for an emergency leachate containment capacity of 150% of the primary containment facility. The plan shall provide a detailed assessment of alternative treatment and disposal if ground water quality standards are exceeded methods along with a plan for implementation of a preferred alternative or combination of alternatives.
Report Due: No later than January 2, 1992.

f. Irrevocable Closure Fund. The discharger shall submit to this Board and to the California Integrated Waste Management Board, evidence of an Irrevocable Closure Fund, pursuant to Section 2580(f) of Chapter 15. The Closure Fund must provide sufficient funds to properly close the waste management unit and for the post-closure monitoring and maintenance of the site. For the purposes of planning the amount of the fun, the discharger shall assume a post-closure period of at least 30 years. However, the post-closure maintenance period shall extend as long as the waste pose a threat to water quality.
Report Due: No later than prior to initiation of remediation.

g. Preliminary Closure and Post-Closure Maintenance Plan. The discharger shall submit to the Board, for approval, a preliminary closure and post-closure maintenance plan pursuant to Title 23, CCR, Chapter 15, Article 9, Section 2597.
Report Due: No later than the submittal of the remediation plan.

h. Ground Water Quality Protection Standards. The discharger shall submit in accordance with the requirements of Article 5 of Chapter 15 a report on the groundwater quality at the site that identifies the background concentrations and water quality protection standards for the constituents listed in the Specifications of this Order.
Report Due: No later than the submittal of the remediation plan.

4. The discharger shall maintain a copy of this order at the project field office so as to be available at all times to project personnel.

5. The discharger's technical reports under subparagraph 2.a, 2.b, 2.c and 2.d hereof shall consider the guidance provided by the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".

6. Technical reports, submitted by the discharger, in compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted to the Board on the schedule specified herein. These reports shall consist of a letter report that includes the following:

a. A summary of work completed since submittal of the previous report and work projected to be completed by the time of the next report;

b. Identification of any obstacles which may threaten compliance with the schedule of this Order and what actions are being taken to overcome these obstacles;

c. In the event of non-compliance with any Prohibition, Specification or Provision of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order, and;

d. In the first self-monitoring report, an evaluation of the current ground water monitoring system and a proposal for modifications as appropriate.

7. All submittal of hydrogeological plans, specifications, reports, and documents (except quarterly progress and self-monitoring reports), shall be signed by and stamped with the seal of a registered geologist, registered engineering geologist, or registered professional engineer.

8. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.

9. The discharger shall maintain in good working order, and operate as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

10. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, submitted by the discharger, shall also be provided to the following agencies:

a. City of Richmond, Planning Department;
b. Contra Costa County Health Department, and;
c. State Department of Health Services, TSCD.

11. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code, the following:

a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order;

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

c. Inspection of any monitoring equipment or methodology implemented in response to this Order; and,

d. Sampling of any ground water or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

12. The discharger shall file with this Board a report of any material change or proposed change in the character, location, or quantity of this waste discharge. For the purpose of these requirements, this includes any proposed change in the boundaries, contours, or ownership of the disposal if ground water quality standards are exceeded areas.

13. The Board considers the discharger, Chevron U.S.A. Inc., the property owner and site

operator to have a continuing responsibility for correcting any problems within their reasonable control which arise in the future as a result of this waste discharge or water applied to this property during subsequent use of the land for other purposes.

14. These requirements do not authorize the commission of any act causing injury to the property of another or of the public, do not convey any property rights, do not remove liability under federal, state or local laws, and do not authorize the discharge of waste without the appropriate federal, state or local permits, authorizations, or determinations.

15. If any hazardous substance is discharged in or on any waters of the state, or discharged and deposited, or probably will be discharged in or on any waters of the state, the discharger shall report such discharge to the following:

    a. This Regional Board at (415) 464-1255 on weekdays during office hours from 8 a.m. to 5 p.m.; and,

    b. The Office of Emergency Services at (800) 852- 7550.

    A written report shall be filed with the Regional Board within five working days and shall contain information relative to the following:

    c. The nature of waste or pollutant;
    d. The quantity involved and the duration of incident;
    e. The cause of spill;
    f. The estimated size of affected area;
    g. The corrective measures that have been taken or planned, and a schedule of these measures; and,
    h. The persons/agencies notified.

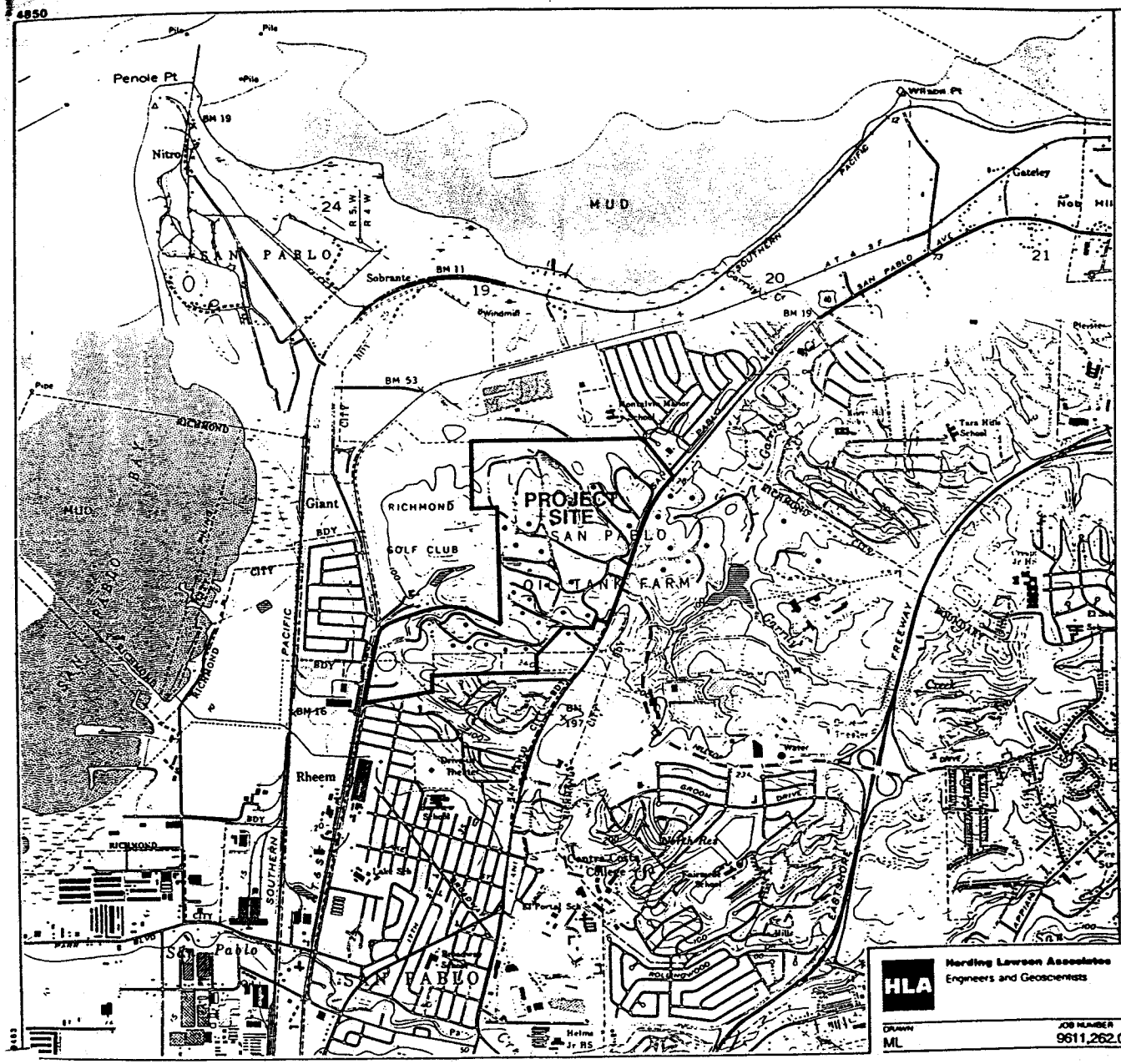
16. The Board will review this Order periodically and may revise the requirements when necessary.

17. If, for reasons beyond the control of the discharger, the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the discharger shall promptly notify the Executive Officer and the Board may consider revision to this Order.

I, Steven R. Ritchie, 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, San Francisco Bay Region on August 21, 1991.

Steven R. Ritchie
Executive Officer

Attachments:
Plate 1: Site Map
Self Monitoring Program
Endnotes



HLA Harding Lawson Associates
Engineers and Geoscientists

Site Location & Topographic Map
Waste Discharge Report
Chevron Hilltop West
Richmond, California

PLATE 1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
ML	9611,262.02		6/88		

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

CHEVRON LAND AND DEVELOPMENT COMPANY

CHEVRON U.S.A., INC.

3260 BLUME DRIVE, SUITE 100

RICHMOND, CONTRA COSTA COUNTY

WASTE DISCHARGE REQUIREMENTS
ORDER NO. 91-125

CONSISTS OF

PART A

AND

PART B

PART A

A. General

1. Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No. 73-16.

2. The principal purposes of a self-monitoring program by a waste discharger are the following:

   a. To document compliance with Waste Discharge Requirements and prohibitions established by the Board;

   b. To facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge;

   c. To develop or assist in the development of standards of performance, toxicity standards and other standards; and,

   d. To prepare water and wastewater quality inventories.

B. Sampling And Analytical Methods

1. Sample collection, storage, and analyses shall be performed according to the most recent version of Standard Methods for the Analysis of Wastewater, and Test Methods for Evaluating Solid Waste EPA Document SW-846, or other EPA approved methods and in accordance with an approved sampling and analysis plan.

2. Water and waste analysis (except total suspended solids) shall be performed by a laboratory approved for these analyses by the State Department of Health. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Board.

3. All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

C. Definition Of Terms

1. A grab sample is a discrete sample collected at any time.

2. Duly authorized representative is a duly authorized representative may thus be either a named individual or any individual occupying a named position such as the following:

   a. Authorization is made in writing by a principal executive officer; or,

   b. Authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as general partner in a partnership, sole proprietor in a sole proprietorship, the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company.

D. Schedule Of Sampling, Analysis, And Observations

Part B

A. Description Of Observation Stations And Schedule Of Observations

1. The observation stations shall consist of the 23 ground water monitoring wells located near the oily soil repositories and any additional ground water monitoring wells added during the soil and ground water remedial action.

2. The schedule of well observations and grab sampling shall be conducted quarterly within the months of January, April, July and October.

B. Observations and Test Procedures

1. The ground water well observations shall consist of the following:

   a. Water elevation reported to the nearest 0.1 inch for both depth to water from the ground surface and the elevation of the ground water level;

   b. Ground water temperature measured at the time of sampling and reported in degrees Fahrenheit;

   c. Ground water electrical conductivity measured at the time of sampling as per Standard Methods 205 using potentiometric methodology;

   d. Ground water pH measured at the time of sampling as per Standard Methods 423 using potentiometric methodology; and,

   e. Ground water turbidity measured at the time of sampling.

2. The test procedures for the ground water samples and soil samples shall consist of the following:

   a. Volatile aromatic compound analysis using the EPA Method 5030/8020;

   b. Total dissolved solids using a gravimetric method;

   c. Total Petroleum Hydrocarbons and Fuel Hydrocarbons using the EPA Method 5030/8015 (Modified); and,

   d. Total Oil and Grease using Standard Methods 418.1, infrared analysis.

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program is as follows:

1. Developed in accordance with the procedures set forth in this Board's Resolution No. 73-16;

2. Effective on the date shown below; and,

3. May be reviewed or modified at any time subsequent to the effective date, upon written notice from the Executive Officer, or request from the discharger.

August 21, 1991
Date Ordered

Steven R. Ritchie
Executive Officer

1. The discharger is required to perform sampling, analysis, and observations according to the schedule specified in Part B, and the requirements in Article 5 of Subchapter 15.

2. A statistical analysis shall be performed and reported annually as described in the current revision of Appendix II of Subchapter 15.

E. Records To Be Maintained By The Discharger

1. Written reports shall be maintained by the discharger for ground water monitoring and wastewater sampling, and shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Board. Such records shall show the following for each sample:

   a. Identity of sample and sample station number;
   b. Date and time of sampling;
   c. Method of composite sampling (See Section C-Definition of Terms);
   d. Date and time that analyses are started and completed, and name of the personnel performing the analyses;
   e. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used. A reference to a specific section of a reference required in Part A Section B is satisfactory;
   f. Calculation of results;
   g. Results of analyses, and detection limits for each analyses; and,
   h. Chain of custody forms for each sample.

F. Reports To Be Filed With The Board

1. Ground water monitoring results shall be filed monthly until the schedule allows quarterly samples, then reports shall be quarterly. Written self-monitoring reports shall be filed no later than 45 calendar days following the end of the report period. In addition an annual report shall be filed as indicated. The reports shall be comprised of the following:

   a. Letter of Transmittal - A letter transmitting the essential points in each self-monitoring report should accompany each report. Such a letter shall include a discussion of any requirement violations found during the last report period, and actions taken or planned for correcting the violations, such as, operation and/or facilities modifications. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred in the last report period this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer at the level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct. The letter shall contain the following certification:

      "I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware

that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

b. Each monitoring report shall include a compliance evaluation summary sheet. Until the Order's amended to specify ground water protection standards, the following shall apply and the compliance sheet shall contain:

   i. The method and time of water level measurement, the type of pump used for purging, pump placement in the well, method of purging, pumping rate, equipment and methods used to monitor field Ph, temperature, and conductivity during purging, calibration of the field equipment, results of the Ph, temperature conductivity and turbidity testing, well recovery time, and method of disposing of the purge water; and,

   ii. Type of pump used, pump placement for sampling, a detailed description of the sampling procedure; number and description of equipment, field and travel blanks; number and description of duplicate samples; type of sample containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations; the chain of custody record.

c. A summary of the status of any remediation work performed during the reporting period. This shall be a brief and concise summary of the work initiated and completed as follows:

   i. As interim corrective action measures; and,

   ii. To define the extent and rate of migrations of waste constituents in the soil and ground water at the site.

d. The discharger shall describe, in the quarterly report, the reasons for significant increases in a pollutant concentration at a well on site. The description shall include the following:

   i. The source of the increase;

   ii. How the discharger determined or will investigate the source of the increase; and,

   iii. What source removal measures have been completed or will be proposed.

e. A map or aerial photograph showing observation and monitoring station locations, and plume contours for each chemical in each aquifer shall be included as part of the quarterly Self-Monitoring Report.

f. Laboratory statements of results of analyses specified in Part B must be included in each report. The director of the laboratory whose name appears on the laboratory certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Board. The following information shall be provided:

   i. The methods of analyses and detection limits must be appropriate for the expected concentrations. Specific methods of analyses must be identified. If methods other than EPA approved methods or Standard Methods are used, the exact methodology must be submitted for review; and,

ii. In addition to the results of the analyses, laboratory quality control/quality assurance (QA/QC) information must be included in the monitoring report. The laboratory QA/QC information should include the method, equipment and analytical detection limits; the recovery rates; an explanation for any recovery rate that is less than 80%; the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.

g. By January 31 of each year the discharger shall submit an annual report to the Board covering the previous calendar year. This report shall contain:

i. Tabular and graphical summaries of the monitoring data obtained during the previous year;

ii. A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the Site Cleanup Requirements; and,

iii. A written summary of the ground water analyses indicating any change in the quality of the ground water.

G. In the event the discharger violates of threatens to violate the conditions of the Site Cleanup Requirements and prohibitions or intends to experience a plant bypass or treatment unit bypass due to:

1. Maintenance work, power failures, or breakdown of waste treatment equipment, or;
2. Accidents caused by human error or negligence, or;
3. Other causes, such as acts of nature.

The discharger shall notify the Regional Board office by telephone as soon as he or his agents have knowledge of the incident and confirm this notification in writing within 7 working days of the telephone notification. The written report shall include time and date, duration and estimated volume of waste bypassed, method used in estimating volume and person notified of the incident. The report shall include pertinent information explaining reasons for the noncompliance and shall indicate what steps were taken to prevent the problem from recurring.

In addition, the waste discharger shall promptly accelerate his monitoring program to analyze the discharge at least once every day. Such daily analyses shall continue until such time as the effluent limits have been attained, until bypassing stops or until such time as the Executive Officer determines to be appropriate. The results of such monitoring shall be included in the regular Self-Monitoring Report.