CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 00-011
NPDES NO. CA0004961

WASTE DISCHARGE REQUIREMENTS FOR:

TOSCO CORPORATION
AVON REFINERY
MARTINEZ, CONTRA COSTA COUNTY

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

1. Tosco Corporation (hereinafter the Discharger), submitted an application for the reissuance of National Pollutant Discharge Elimination System (NPDES) Permit No. CA0004961. The application, referred to as Report of Waste Discharge, consists of: a completed U.S. Environmental Protection Agency (USEPA) Form 3510 (Form 1 – General Facility Information); Form 2C (Wastewater Discharge Information); Attachments 2, 3, 4, 5, 6, 7 and 8; and, Form 2F (Stormwater Discharger Information).

FACILITY DESCRIPTION

2. The Discharger owns and operates a petroleum refinery facility (hereinafter the Avon Refinery) and Amorco Terminal (hereinafter the Terminal) in Contra Costa County. The street address of the Avon Refinery is 150 Solano Way, Martinez, CA 94553. Crude oil, which is transported to the refinery either by tanker or through pipeline, is cracked and blended for the production of unleaded gasoline and diesel fuel. **Figure 1** is the location map of the Avon Refinery.

3. The Avon Refinery processes an average total crude throughput of 150,000 barrels per day (bbl/d). Although the current Avon Refinery operates at less than this capacity due to economic considerations, the Discharger has stated that its anticipated total crude throughput could be approximately 150,000 bbl/d.

EXISTING PERMIT

4. Wastewater discharged from the Avon Refinery and the Terminal is currently regulated by Waste Discharge Requirements that are specified in Order No. 93-068 and amended Order No. 95-138 (collectively referred hereinafter as the Previous Order).

5. Before the expiration date of the Previous Order, the Board issued a letter administratively extending the terms and conditions of Order Nos. 93-068 and 95-138 until a new Order is adopted.

REFINERY CATEGORY

6. The Discharger is classified as a cracking refinery, which is defined by the USEPA in 40 CFR 419.20.

MAJOR DISCHARGER

7. The State and the USEPA have classified the Tosco Corporation's Avon Refinery as a major discharger.

WASTEWATER DISCHARGES

8. The Report of Waste Discharge, recent self-monitoring reports, and other relevant available information describe the discharges as follows:

   a. **Waste 001** consists of: refinery process wastewater; coke pond overflow; cooling tower blowdown; boiler blowdown; non-segregated ballast water; tank draws; sanitary wastes; neutralized demineralizer regeneration water (hereinafter the Reject Water) from the water treatment system; groundwater from remediation activities; and, non-hazardous wastewater generated from off-site[1] Tosco Corporation-owned facilities. In addition, process waste water from the Monsanto Company Catalyst Plant, cooling tower and boiler blowdown from Foster-Wheeler Cogeneration Plant, cooling tower blowdown from Air Liquide Carbon Dioxide Plant, and boiler blowdown from Air Products Hydrogen Plant are also treated by the Discharger on the site. The total average dry weather flow rate of Waste 001 is approximately 2.7 million gallons per day (MGD). During wet weather, Waste 001 has an additional component consisting of stormwater runoff from various on-site developed areas of Tracts 1, 2 and 3, and off-site facilities[2]. The annual average of wet weather flow is approximately 4.3 MGD. Detailed description of the stormwater component of this waste is provided in other Findings.

      After treatment, Waste 001 is discharged to Suisun Bay via a 27-inch diameter outfall pipe equipped with a multi-port diffuser, located under the Avon Wharf 45 feet below mean lower low water. This discharge location is referred to as E-001 (lat. 38°02′54″, long. 122°05′22″). The hydraulic design capacity of the diffuser outfall can handle an instantaneous peak discharge rate up to 14,000 gallons per minute (GPM). The current instantaneous maximum discharge from the refinery is approximately 9,000 GPM of combined stormwater and treated effluent.

   b. **Waste 003** consists of stormwater runoff from an area of approximately 120 acres in the central and western portions of the Tract 4 tank farm. Detailed description of this waste is provided in other Findings. It is discharged from a series of holding ponds to a holding ditch to Pacheco Creek at two possible locations. Since these two locations are in proximity to each other, they are collectively designated as E-003 (lat. 38°00′44″, long. 122°03′55″).

   c. **Waste 004** consists of stormwater runoff from an area of 140 to 150 acres including the southeast portion of the Tract 4 tank farm and all of the Tract 6 tank farm, and off-site facilities including the Monsanto Company Catalyst Plant, Air Liquide, Chevron Bulk

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[1] The terms "Avon Refinery", "refinery", and "site" are used interchangeably for the purpose of this Order.

[2] Offsite contaminated stormwater runoff from the neighboring facilities including: Bormec General Construction, Air Liquide, Chevron Avon Terminal, Contra Costa Electric, Foster-Wheeler Energy Corporation, Air Products Hydrogen Plant, Monsanto Company, Olin Jones Sand Company, PG&E Avon Substation, Royal Trucking, Kinder Morgan Energy Partners, Southern Pacific Transportation Company, and Texaco Metering Station.

Terminal Station, Kinder Morgan Energy Partners, Texaco Pump Station, and PG&E Substation. A detailed description of this waste is provided in other Findings. The Previous Order allows discharge of stormwater runoff from these areas to the head of Hastings Slough via six L-shaped overflow pipes. These six discharge locations are approximately a foot away from each other. The quality of water leaving any of these six pipes is expected to be similar. These discharge locations are collectively designated as E-004 (lat. 38°01′21″, long. 122°03′30″).

d. **Waste 005** consists of stormwater runoff from various small areas throughout the Avon Refinery and the Terminal. The corresponding discharge locations and potential pollutants of concern are shown in the following table:

Source Areas of Waste 005			
Area Designation	Location	Current E-005 Discharges [a]	Potential Pollutants of Concern
U-T1E	East side of Tract 1	None	TPHs [e], O&G [b]
U-T2N	North end of Tract 2	E-005-T2N	Sed [c], O&G
U-T2NW	Northwest Corner of Tract 2	E-005-T2NW	Sed, O&G
U-T2S	South end of Tract 2	E-005-T2S	Sed, M [d], O&G
U-T2SW	Southwest Corner of Tract 2	E-005-T2SW	Sed, M, O&G, TPHs.
U-T3N	North end of Tract 3	None	TPHs, O&G
U-T3SE	Southeast portion of Tract 3	None	None
U-T3SW	Southwest portion of Tract 3	None	None
U-T4NW	Northwest corner of Tract 4	E-005-T4NW	Sed, O&G
U-T4SW	Southwest corner of Tract 4	E-005-T4SW	Sed, O&G
U-T6NE	Northeast corner of Tract 6	E-005-T6NW	Sed, M, O&G, TPHs.
U-T6SW	Southwest portion of Tract 6	E-005-T6SW	None
U-AW	West end of Amorco Terminal	E-005-AW	Sed, O&G, TPHs
U-AS	South side of Amorco Terminal	E-005-AS	Sed, O&G, TPHs
Note:	[a] Under normal rainfall condition [b] Oil & Grease	[c] Sediment [d] Metals	[e] Total Petroleum Hydrocarbons

A detailed description and location map for each of the above source areas are included as **Attachment A**.

WASTEWATER DISTRIBUTION SYSTEM

9. Process wastewater, sanitary sewage, and most of the stormwater runoff from the Avon Refinery and some off-site industrial facilities are collected and treated in a wastewater treatment system. The major wastewater transfer and distributing system consists of oily sewers, a "Clean Sewer", and a 10,000-foot "Clean Canal", which are described below:

    a. Oily sewers collect oily wastewater, contaminated stormwater, some non-oily wastewater, chemical plant wastewater, and sanitary wastes which are collected throughout the Refinery. All wastewater collected in the oily sewers are treated at the wastewater treatment plant;

    b. Reject Water and uncontaminated stormwater runoff are collected in the "Clean Sewer" and conveyed to the "Clean Canal Forebay", in which an aerator is deployed to enhance the dissolved oxygen level prior to being discharged to the "Clean Canal"; and,

    c. Effluent from the "Clean Canal Forebay" joins with the treated process wastewater in the "Clean Canal", from where the combined effluent flows through a sump before it is pumped to the deep-water diffuser in Suisun Bay. During dry weather, the "Clean Sewer" operates at an average rate of 150 GPM.

WASTEWATER TREATMENT UNITS

10. **Figure 2** is a flow diagram of the on-site wastewater treatment system. Oil-water separators remove oil and sediment by gravity, followed in series by four dissolved nitrogen flotation (DNF) units that further remove oil and grease using polymers and coagulants. Oily material from the separators is recycled back into the petroleum refining process for oil recovery. The DNF effluent flows to an air stripper, which reduces the amount of volatile compounds in the wastewater stream.

11. Non-oily refinery wastewater and chemical plant wastewater, including acid plant effluent and ammonia recovery unit bottoms, are pH-adjusted and then combined with the effluent from the DNF. This combined stream flows through the air stripper before being sent to two biological treatment ponds for aerobic bio-treatment. An odor control system is installed around the perimeter of the inlet portion of the first pond. This odor control system is operated if conditions warrant. Approximately 1,500 GPM of effluent from the first pond are recycled back to the inlet section to enhance biological treatment and to assist in the remediation of the "Oily Canal", which was previously part of the oily-water transport system but now is inactive. Wastewater from the second pond is pumped to either a pH adjustment/clarifier section of the wastewater treatment plant, or to the Bio-oxidation Pond for further stabilization.

12. The Bio-oxidation Pond effluent is then pH-adjusted, clarified, sand-filtered, and if necessary, sent through the granular activated carbon columns for toxicity reduction before discharge into the "Clean Canal" or Coke storage pond for re-use. Effluent from the "Clean Canal" is either discharged to Suisun Bay or diverted back to the Bio-Oxidation Pond for temporary storage.

13. The wastewater treatment plant has twelve Rotating Biological Contactors (RBCs) located downstream of the Bio-Oxidation Pond. These RBCs were installed in the 1960s. Since then, additional treatment units including the two aerated ponds and the Bio-Oxidation Pond

have been added upstream of the RBCs. These ponds provide the same or even better bio-treatment than the RBCs, making the latter units redundant. On February 25, 1999, the Discharger submitted operation data indicating that the typical low levels of biological oxygen demand (BOD) and ammonia in the RBCs' influent result in low RBC removal efficiencies for these pollutants. Considering that the continuous operation of these RBCs are not cost-effective and the existing pond system provides a better treatment efficiency, the Discharger requested the deletion of the RBCs from the existing wastewater treatment scheme. The Board finds that discontinuing the RBC operation will not substantially alter the characteristics of the discharge at outfall E-001. Provided that the RBCs could be put back into service within the wastewater treatment plant if future treatment performance cannot be maintained at the current level, the Discharger's request is hereby approved.

POND SYSTEM

14. The No. 1 and No. 2 Biological Treatment Aerated Ponds (formerly known as Surge Ponds) cover 14 acres and 6 acres, respectively. The first pond has a storage capacity of approximately 13.6 million gallons; the second pond can store up to approximately 7.8 million gallons of wastewater. Flow between the two ponds is by gravity. Under normal operating conditions, each pond is maintained at an average depth of approximately six feet. These ponds are equipped with aerators to provide primary biological wastewater treatment.

15. The Bio-Oxidation Pond is the largest pond in the wastewater treatment system. It is divided into four cells, and covers a total area of approximately 104 acres in Tract 3. Mechanical aeration is provided in the first cell. In normal conditions, water depth in this pond is maintained at approximately three feet, with a total storage volume of approximately 100 million gallons. During wet weather, this pond can provide an additional 100 million gallons of storage capacity by increasing the water depth to six feet. In addition to biological treatment, this pond also provides equalization to enhance wastewater treatment effectiveness. The residence time of wastewater in the Bio-oxidation Pond is approximately 20 to 30 days.

16. There are numerous holding ponds and impoundments throughout the refinery and the Terminal. These ponds and impoundments are used for the storage of stormwater runoff for either subsequent treatment at the wastewater treatment plant or discharge through outfalls E-003 and E-004.

STORMWATER MANAGEMENT

17. Approximately 98% of the total stormwater runoff at the refinery is collected and conveyed to one of the abovementioned discharge outfalls (E-001, E-003, and E-004). **Figure 3** is a schematic diagram illustrating the stormwater management system for the Avon Refinery. The Discharger has indicated that much of the stormwater that enters the retention ponds associated with outfalls E-003 and E-004 eventually evaporates. Because these ponds have large volume, discharge from these locations has been infrequent. Over the past ten years, there were only five and eleven discharges through E-003 and E-004, respectively.

18. The E-001 discharge point accepts most of the stormwater runoff collected in Tracts 1, 2, and 3. Most of the stormwater that has been exposed to industrial activities is processed in the wastewater treatment plant prior to discharge via E-001 to Suisun Bay. Stormwater runoff that is not exposed to industrial activities (roughly 5%) is combined with treated stormwater before being discharged through E-001 to Suisun Bay.

19. E-003 is located in Tract 4 and drains stormwater from approximately 120 acres. Approximately less than one percent of this area is paved. Stormwater that falls on the west side of Tract 4 is collected within tank dikes and several retention ponds downhill of the tanks. A long retention basin located further downhill serves as a backup for these ponds. If runoff is excessive, causing the level in the retention basin to rise, water in the retention basin will be laundered indirectly to Pacheco Creek through outfall E-003. Launderers are inverted L-shaped overflow pipes that draw water from below the surface, thereby keeping oil and other floating material in the pond for subsequent removal.

20. E-004 is located in Tract 6 and drains an area of approximately 150 acres. Less than one percent of the area is paved. Stormwater that runs off the east side of Tract 4, the southern part of Tract 6 around the tank farm, and the northern part of Tract 6 (except runoff from the Chemical Plant, that drains to an oily sewer and is discharged through E-001) is collected, conveyed through ditches, and discharged through launderers to Cardox Pond. Water in the Cardox pond can be pumped to E-001 or laundered indirectly at outfall E-004 to Hastings Slough.

STORMWATER POLLUTION PREVENTION PLAN

21. Although much of the remaining 2% of stormwater runoff evaporates or infiltrates into the soil, a portion of this stormwater still discharges as Waste 005 to unimproved areas adjacent to Pacheco Creek or Hastings Slough. Determination of the E-005 discharge locations was one of the subjects of the Discharger's 1994 Stormwater Pollution Prevention Plan (SWPPP), which was approved by the Board. The objectives of the SWPPP were to identify:

    a. Existing measures and management practices for the control of stormwater discharges; and,
    b. The need for additional control measures to eliminate the source of polluted stormwater runoff.

22. The SWPPP also established a monitoring program to assess the effectiveness of the control measures and overall water quality. .

23. The Previous Order does not specify compliance-sampling requirements for these E-005 discharges. It is the intent of this Order to regulate these discharges by either total elimination or minimizing the discharge volume and pollutant loads to the receiving waters.

REGIONAL MONITORING PROGRAM

24. On April 15, 1992, the Board adopted Resolution No. 92-043 directing the Executive Officer to implement the Regional Monitoring Program (RMP) for the San Francisco Bay. Subsequent to a public hearing and various meetings, Board staff requested major permit holders in this region, under authority of section 13267 of California Water Code, to report on the water quality of the estuary. These permit holders, including the Discharger, responded to this request by participating in a collaborative effort, through the San Francisco Estuary Institute (formerly the Aquatic Habitat Institute). This effort has come to be known as the San Francisco Bay Regional Monitoring Program for Trace Substances. This Order specifies that the Discharger shall continue to participate in the RMP, which involves collection of data on pollutants and toxicity in water, sediment and biota of the estuary. Annual reports from the RMP are referenced elsewhere in this Order.

EFFLUENT TOXICITY CONTROL PROGRAM

25. The Basin Plan adopts an Effluent Toxicity Control Program (ETCP) that requires certain permit holders, including the Discharger, to monitor the toxicity of their effluent using critical life stage toxicity tests. The Board implements the water quality objective for toxicity through the ETCP and by monitoring the toxicity of waters at or near discharge sites. The long-term goal of the ETCP is to develop water quality based effluent limits using information about the acute and chronic toxicity of each discharge and resulting toxicity in the receiving water. This Order specifies that the Discharger shall continue its effluent toxicity monitoring efforts as part of the compliance requirements.

RECEIVING WATER SALINITY

26. The Previous Order describes the receiving water for Waste 001 as marine. It was based on the information submitted by the Discharger during the period from 1990 to 1991; and, the water quality data collected by Department of Water Resources (DWR) from its monitoring station at the Benicia Bridge during the years 1984, 1985, 1986, 1992, and 1993.

27. From 1993 through 1998, Central Contra Costa Sanitary District (CCCSD) collected water quality data from Suisun Bay at locations downstream of the Discharger's outfall E-001. CCCSD's data indicate that, in less than 75 percent of the time, the salinity of Suisun Bay is larger than 5 parts per thousand (ppt). However, the trend of high salinity during wet seasons and low salinity in dry seasons is not consistent with that based on RMP data. On December 22, 1998, the Discharger submitted additional salinity data gathered by DWR between July 1997 and August 1998.

28. The data collected by RMP, DWR and CCCSD indicate that the salinity of Suisun Bay in the vicinity of outfall E-001 varies spatially and seasonally, but the trend of variation is not clear. To establish the long-term characteristic of the salinity variation in Suisun Bay at or near outfall E-001, this Order requires the Discharger to monitor the salinity of the receiving water. Considering the anti-backsliding policy, this Order continues the existing designation of the receiving water as marine. Should future salinity data indicate that the receiving water is not of marine condition, this Order may be modified as necessary.

TOTAL COLIFORM IN EFFLUENT E-001

29. The Previous Order specifies two in-stream compliance points for total coliform at locations D1 and D2, which are both upstream of the No. 1 Biological Treatment Aerated Pond. Recent data submitted by the Discharger indicate that elevated concentrations of total coliform are found in wastewater at locations downstream of these two compliance points. The Discharger indicates that the presence of high levels of total coliform may be attributed to sources other than the refinery (e.g. wildlife animals and birds). Since most of the treatment ponds and wastewater conveyance system are uncovered and located in open areas, the Discharger believes that it is not feasible to control or eliminate these non-refinery sources of total coliform. This Order requires the Discharger to identify and eliminate all refinery sources that may have contributed to the high levels of total coliform in the disinfected wastewater.

CHRONIC TOXICITY

30. On July 30, 1997, the Discharger submitted a screening phase chronic toxicity proposal as part of its NPDES Permit renewal. Results from Tier 1 and Tier 2 screening phase tests indicate that Atherinops affinis is a more sensitive species to the refinery effluent than Menidia beryllina, which is the current compliance species based on previous effluent characterization studies. Atherinops affinis is: a representative estuarine fish species; indigenous to the estuary, specifically Suisun Bay; prevalent on the west coast; and, an important food species for other organisms. The test methodology for this species has been approved by the USEPA, and is described in "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms" (USEPA/600/R-95/136). This Order requires the Discharger to use Atherinops affinis as chronic toxicity compliance species. If the Discharger would like to use long-term data to determine which species is actually more sensitive, parallel test using both Atherinops affinis and Menidia beryllina shall be conducted during the life of this Order.

DIOXINS AND FURANS

31. The Discharger has violated the limitation of 0.14 picogram per liter (pg/l) for TCDD Equivalent (TEQ) specified in the Previous Order. On November 15, 1995, the Board issued Cease and Desist Order (CDO) No. 95-151 to the Discharger for violating the effluent limitation for dioxins and furans. The CDO required the Discharger to investigate the causes of the violations, develop and study treatment technologies, and comply with the limitation by July 1, 1999. In the interim, the CDO specified a limit of 0.14 pg/l for 2,3,7,8-TCDD only. The Discharger has not reported violations of the CDO's interim limit.

32. The Discharger investigated the cause of the violations, and concluded that the primary causes are related to atmospheric deposition from diffuse sources that are affecting various wastewater streams. Considering the results of the investigation, the Discharger stated that it should not have to comply with the CDO No. 95-151 final compliance date of July 1, 1999 since that could only be done through treatment technologies. By removing aerators and obstructions in the "Clean Canal" to control solids re-suspension, the Discharger has reduced the concentrations of dioxins and furans from a maximum value of 13 pg/l TEQ prior to the CDO, to consistently less than 0.5 pg/l TEQ since 1998. Besides, the Discharger continues work toward additional reduction of air emission of dioxins and furans from the No. 3 Reformer Unit even though it is not required by the Bay Area Air Quality Management District.

33. The Board concurred with the Discharger's conclusion regarding the causes of dioxin exceedances, that they were primarily caused by atmospheric deposition from diffuse sources. On June 15, 1999, the Board adopted CDO No. 99-046, amending CDO No. 95-151 to extend the final compliance of the effluent limitation for TCDD specified in A.3 of the Previous Order to no later than July 1, 2000. The Board has also referred the dioxin issue to the California Environmental Protection Agency, since resolution of the problem will depend on a multi-media approach.

34. This Order retains the Previous Order's effluent limitation for dioxins and furans, and CDO No. 99-046 remains in effect. The effluent limitation may be revised based on an adopted total maximum daily load or revised water quality objectives for dioxins and furans.

APPLICABLE PLANS, POLICIES AND REGULATIONS

35. On June 21, 1995, the Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan), which was subsequently approved by the State Water Resources Control Board (State Board) and the Office of Administrative Law on July 20, and November 13, respectively, of 1995. The Basin Plan identifies beneficial uses and water quality objectives for surface waters in the region, as well as effluent limitations and discharge prohibitions intended to protect those uses. This Order implements the plans, policies, and provisions of the Board's Basin Plan.

36. The beneficial uses of Suisun Bay, Hastings Slough, Pacheco Creek, Carquinez Strait, and their tributaries are, in part or in entirety:

    a. Industrial Service Supply
    b. Navigation
    c. Water Contact Recreation
    d. Non-Contact Recreation
    e. Ocean Commercial and Sport Fishing
    f. Wildlife Habitat
    g. Preservation of Rare and Endangered Species
    h. Fish Migration and Spawning
    i. Estuarine Habitat
    j. Shellfishing

37. The reissuance of waste discharge requirements for these discharges is exempt from the provisions of Chapter 3 (commencing with section 21100 of Division 13) of the Public Resources Code (CEQA) pursuant to section 13389 of the California Water Code.

38. Under 40 CFR 122.44, "Establishing Limitations, Standards, and Other Permit Conditions", NPDES permits should also include toxic pollutant limitations if the Discharger uses or manufactures a toxic pollutant as an intermediate or final product or byproduct.

39. Effluent limitations and toxic effluent standards established pursuant to sections 301, 304, 306, and 307 of the Federal Water Pollution Control Act and amendments thereto are applicable to the discharges herein.

40. Effluent limitation guidelines requiring the application of best practicable control technology currently available (BPT), best conventional pollutant control technology (BCT), and best available technology economically achievable (BAT) were promulgated by the USEPA for some of the pollutants in this discharge. Effluent limitations for pollutants not subject to the USEPA effluent limitation guidelines are based on one of the following: best professional judgment (BPJ) of BPT, BCT or BAT; current plant performance; or, they are water quality-based effluent limitations (WQBELs). The WQBELs are based on the Basin Plan, other State Plans and policies, or USEPA water quality criteria. The attached fact sheet for this Order includes the specific basis for each effluent limitation.

303(d)-LISTED POLLUTANTS

41. On May 12, 1999, the USEPA approved a revised list of impaired waterbodies prepared by the State. The list (hereinafter referred to as the 303(d) list) was prepared in accordance with section 303(d) of the federal Clean Water Act to identify specific water bodies where water

quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources. Suisun Bay is listed as one of these impaired water bodies. The pollutants impairing Suisun Bay include copper, mercury, nickel, selenium, exotic species, PCBs total, dioxin and furan compounds, chlordane, DDT, Dieldrin, Diazinon, and dioxin-like PCBs.

TOTAL MAXIMUM DAILY LOADS and WASTE LOAD ALLOCATIONS

42. Based on the 303(d) list of pollutants impairing Suisun Bay, the Board plans to adopt Total Maximum Daily Loads (TMDLs) for these pollutants no later than 2010. However, future review of the 303(d) list for Suisun Bay may result in revision of the schedules and/or provide schedules for other pollutants.

43. The TMDLs will establish waste load allocations (WLAs) and load allocations for point sources and non-point sources, respectively, and will result in achieving the water quality standards for the waterbody. The final effluent limitations for this discharge will be based on WLAs that are derived from the TMDLs.

44. The following summarizes the Board's strategy to collect water quality data and to develop TMDLs:

    a. Data collection – The Board will request dischargers collectively assist in developing and implementing analytical techniques capable of detecting 303(d)-listed pollutants to at least their respective levels of concern or water quality objectives. The Board will require dischargers to characterize the pollutant loads from their facilities into the water-quality limited waterbodies. The results will be used in the development of TMDLs, but may also be used to update/revise the 303(d) list and/or change the water quality objectives for the impaired waterbodies including Suisun Bay.

    b. Funding mechanism – The Board has received, and anticipates continuation to receive, resources from federal and state agencies for the development of TMDLs. To ensure timely development of TMDLs, the Board intends to supplement these resources by allocating development costs among dischargers through the RMP or other appropriate funding mechanisms.

REASONABLE POTENTIAL (RP) ANALYSIS

45. 40 CFR 122.44(d)(1)(ii) requires that when determining whether a discharge causes, has the reasonable potential to cause, or contributes to a receiving water excursion above a narrative or numeric criterion within the State water quality standards, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water.

46. Each toxic/priority pollutant detected in the effluent discharge from the site has been evaluated with respect to its RP to cause or contribute to exceedance of the relevant water quality objective. For the metal constituents, monitoring data collected during the period from July 1996 through July 1999 (with the exception of copper, cyanide, nickel, and selenium) were evaluated. For the organic pollutants including tributyltin and those measured by USEPA Methods 608, 610, 624, 625, and 1613A, effluent data were obtained

from self-monitoring reports of 1994 through 1999. The number of data used in the RP analysis varies depending on the abundance of available effluent data.

47. In performing the RP analysis, pollutants reported as non-detected were assumed to have concentrations at their detection limits. This assumption is consistent with the intent of the RP evaluation in which anticipated maximum receiving water effluent concentrations are compared with the appropriate narrative or numerical water quality objectives/criteria to determine if the potential of excursions above these objectives/criteria exists.

48. Because of effluent variability, there is always some degree of uncertainty in determining an effluent's impact on the receiving water. The USEPA's Technical Support Document for Water Quality-Based Toxics Control (TSD) of 1991 (USEPA/505/2-90-001) addresses this issue by suggesting the use of a statistical approach, on which the RP analysis for this Order is based. The anticipated maximum effluent concentration of each pollutant is calculated using a 99% confidence level and a 99% probability.

49. The Basin Plan allows dilution, up to 10:1, for discharges to deep water. In a previous dilution study, the Discharger reported that the receiving water for Waste 001 provides an initial dilution of at least 10:1. For pollutants on the 303(d) list as impairing Suisun Bay, the USEPA has commented that there is a lack of assimilative capacity in the receiving water, and that it is inappropriate to allow any dilution in projecting maximum receiving water concentrations of the 303(d)-listed pollutants. This RP analysis evaluates both situations with and without a 10:1 dilution. Because the waterbody is impaired, no dilution is used in the statistical determination of RP for the 303(d)-listed pollutants.

50. The maximum receiving water concentration of each pollutant is estimated considering the background level, dilution, 303(d) listing, and maximum effluent concentrations. The resulting receiving water concentration is compared to the appropriate water quality objective. When there is no specific numerical water quality objective available in the Basin Plan, the appropriate water quality criterion in the USEPA's National Toxics Rule (NTR) is considered. Criteria specified in the proposed California Toxics Rule (CTR) are also reviewed if no applicable criteria are available in NTR. For the purpose of determining RP, a translator value of 1 is assumed for the ratio of dissolved portion vs. total recoverable portion of each metal pollutant. This is consistent with the USEPA's "Metal Translator Guidance for Calculating A Total Recoverable Permit Limit from a Dissolved Criterion" (USEPA 823-B-96-007) of 1996.

51. Tables A through C of this Order summarize the RP analysis results for the toxic and priority pollutants monitored at the site. The following chemical pollutants exhibit RP to cause or contribute to exceedance of the relevant water quality objectives in the receiving water irrespective of whether or not 10:1 dilution is allowed, except for Copper, which would not exhibit reasonable potential if the dilution ratio were assumed:

    Cyanide, Mercury, Nickel, Selenium, Silver, Beta-BHC, Gamma-BHC, Endosulfan, Tributyltin, and Copper.

52. For pollutants including Aldrin, alpha-BHC, Chlordane, DDT, Dieldrin, Endrin, Heptachlor, Heptachlor Epoxide, Hexachlorobenzene, PAHs, Pentachlorophenol, PCB total, and Toxaphene, their existing effluent limits are below the levels that current analytical techniques can measure. Hence, their maximum receiving water concentrations cannot be meaningfully determined by the abovementioned statistical procedures. Because the actual

loads of these pollutants discharged from the site are unknown and these chemicals may have been used on-site, it is reasonable to conclude that the RP exists for each of these pollutants. Since TCDD Equivalent has been detected in the final effluent at concentrations above the permit limit and Avon Refinery is identified as a source, this pollutant is determined to have RP of causing or contributing exceedances of the water quality objective.

EFFLUENT LIMITS DELETION

53. Based on the RP results, the following existing effluent limitations are excluded in this Order as they do not pose reasonable potential to cause, or contribute to an excursion above any numeric or narrative water quality objectives:

    a. Daily average effluent concentration limits for Arsenic, Cadmium, Hexavalent Chromium, Lead, Zinc; and
    b. Monthly average concentration limits for Benzene, Chloroform, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Dichloromethane, Fluoranthene, Halomethanes, Phenol, Toluene, and 2,4,6-Trichlorophenol.

DELETION OF EFFLUENT LIMITATION CREDIT FOR RECLAIMED WATER USE

54. The Previous Order allows for the use of an unspecified amount of reclaimed water provided by CCCSD and the Contra Costa Water District (CCWD) for cooling tower make-up water. Over the last five years, the Discharger has not used reclaimed water as influent supply for any refinery processes. In addition, the Board has rescinded the permit for CCWD's reclaimed water project. As a result, this Order discontinues the provision for allowing effluent limitation credit for reclaimed water use. Should the water reclamation project be revived and if the Discharger has a plan to use reclaimed water, this Order may be amended.

BASES FOR EFFLUENT LIMITATIONS

55. When a discharge causes, has the reasonable potential to cause, or contributes to an receiving water excursion above a narrative or numeric criteria within a State water quality standard, federal law and regulations require the establishment of WQBELs that will protect water quality. Pollutants exhibiting RP in the discharge authorized by this Order are identified in above Findings. The Board plans to adopt TMDLs that will include WLAs for the 303(d)-listed pollutants. When each TMDL is complete, the Board will adopt a WQBEL consistent with the corresponding WLA. If authorized, a time schedule may be included in the revised permit to require compliance with the final WQBELs.

56. In the interim, until final WQBELs are adopted, state and federal antibacksliding and antidegradation policies require that the Board retains effluent concentration limits from the Previous Order to ensure that the waterbody will not be further degraded. In addition to interim concentration limits, interim performance-based mass limits are required to limit the discharge of 303(d)-listed pollutants to their current levels. These interim mass limits are based on recent discharge data. The existing mass limit for selenium must also be maintained as an interim limit according to state and federal antidegradation policies. Where pollutants have existing high detection limits (such as for PCBs total, Chlordane, DDT, Dieldrin, Dioxins and Furans, etc.), interim mass limits are not required because meaningful performance-based limits cannot be calculated for those pollutants with non-detectable concentrations. However, the dischargers, through participation in the RMP, are required to investigate alternative analytical procedures that result in lower detection limits.

57. In the event that a TMDL is not adopted by 2010, and an extension of the schedule has not been granted by the USEPA, the Board will impose one of the following alternative final limits:

    a. For a 303(d)-listed bioaccumulative pollutant, the final alternative limit will be no net loading (No net loading means that the actual loading from the discharge must be offset by at least equivalent loading of the same pollutant achieved through mass offset). In the absence of a TMDL, any loading to the impaired waterbody has the reasonable potential to cause or contribute to an excursion of the narrative toxicity criterion. Additionally, the existing numeric objective may not be adequate to ensure safe levels of the pollutant in sediment and/or fish. This is because in the case of fish tissue, the bioconcentration factor (BCF), on which the criterion was based, was measured in the laboratory and, therefore, reflects uptake from the water only. Bioaccumulative factors (BAFs) on the other hand, are measured in the field where the uptake in fish is through both food and water. Thus, the bioaccumulation rate in the system may be greater than the bioconcentration rate used to calculate the national water quality, which is based on a laboratory-derived BCF. Another reason that the existing water quality objectives may not be adequate is that the criteria they are based on do not always account for routes of exposure, for site-specific circumstances that may render the pollutant more bioavailable, for accumulation in sediment, or for concentrating effects resulting from evaporation.

    b. For a 303(d)-listed non-bioaccumulative pollutant, the alternative final mass limit will be based on water quality objectives applied at the end of the discharge pipe.

WASTE MINIMIZATION

58. Pollutants listed on the 303(d) list or identified in Findings 51 and 52 have reasonable potential to cause or contribute to exceedance of State water quality standards. To help achieve water quality objectives, the Discharger shall implement a waste minimization plan in addition to complying with the effluent limitations. This Order contains a provision requiring the Discharger to submit and implement a waste minimization plan for these pollutants.

OPTIONAL MASS OFFSET

59. This Order contains requirements to prevent further degradation of the impaired waterbody. Such requirements include the adoption of mass limits that are based on the treatment plant performance, provisions for aggressive source control and waste minimization, feasibility studies for wastewater reclamation, and treatment plant optimization. After implementing these efforts, the Discharger may find that further net reductions of the total mass loadings of the 303(d)-listed pollutants to the receiving water can be achieved through a mass offset program. This Order includes an optional provision for a mass offset program.

NOTIFICATION

60. The Board notified the Discharger and interested agencies and persons of its intent to re-issue waste discharge requirements for the discharge, and has provided them with an opportunity for a public hearing and to submit their written views and recommendations.

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

IT IS HEREBY ORDERED that the Discharger, in order to meet the provisions of Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Prohibitions

1. The discharge of treated Waste 001 to Suisun Bay at any point at which the effluent does not receive a minimum initial dilution of at least 10:1 is prohibited, unless otherwise specified in Provision A.12 of the Standard Provisions and Reporting Requirements, August 1993.

2. Discharges of water, materials, thermal wastes, elevated temperature wastes, toxic wastes, deleterious substances, or wastes other than those authorized by this Order, to a storm drain system, tributaries of Suisun Bay, or waters of the State are prohibited.

3. Non-segregated ballast water received by the refinery shall be treated at the wastewater treatment plant prior to discharging to Suisun Bay and/or its tributaries.

B. Effluent Limitations

1. The discharge of Waste 001 shall not have a pH value less than 6.0 nor greater than 9.0.

2. The median of 5 consecutive samples collected from the discharge of Waste 001 at locations E-001-D1 and E-001-D2 shall not have total coliform bacteria exceeded 240 MPN/100ml. Any single sample shall not exceed 10,000 MPN/100ml.

3. The discharge of Waste 001 shall not have residual chlorine greater than 0.0 mg/l.

4. The discharge of Waste 001 shall meet the following toxicity limitations:

   a. Acute Toxicity:

      The survival of test fishes in parallel 96-hour flow-through bioassays of Waste 001 as discharged shall be an eleven-sample[3] median value of not less than 90-percent survival, and an eleven-sample 90-percentile[4] value of not less than 70-percent survival. Test fishes shall be specified in the Self-Monitoring Program. Parallel tests with two species of fish are considered two separate tests.

   b. Chronic Toxicity:

      An eleven-sample median value[5] of 10 TUc[6], and a 90-percentile value of 20 TUc[7].

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[3] A bioassay test showing survival of less than 90-percent represents a violation of this effluent limitation, if five or more of the past ten or less bioassay tests show less than 90-percent survival.

[4] A bioassay test showing survival of less than 70-percent represents a violation of this effluent limit, if one or more of the past ten or less tests shows less than 70-percent survival.

[5] A test sample showing chronic toxicity greater than 10 TUc represents consistent toxicity and a violation of this

5. The discharge of Waste 001 containing constituents in excess of the following limit is prohibited:

Constituent	Unit	Monthly Average	Daily Maximum
BOD (5day @ 20°C)	lb/day	2,311	4,161
	Kg/day	1,050	1,891
TSS	lb/day	1,849	2,900
	Kg/day	840	1,318
COD	lb/day	16,138	31,099
	Kg/day	7,334	14,134
Oil & Grease	lb/day	672	1,261
	Kg/day	305	573
Phenolic compounds	lb/day	10.8	31.1
	Kg/day	4.9	14.1
Ammonia as N	lb/day	1,261	2,774
	Kg/day	573	1,260
Sulfide	lb/day	12	27
	Kg/day	5.4	12.2
Total Chromium	lb/day	12.6	36.4
	Kg/day	5.7	16.5
Hexavalent Chromium[8]	lb/day	1.0	2.3
	Kg/day	0.4	1.0
Settleable Solids	ml/l/hr	0.1	0.2

6. In addition to the monthly average and daily maximum pollutant mass allowances shown in B.5 above, allocations for pollutants attributable to stormwater runoff discharged as a part of Waste 001 are permitted in accordance with the following schedules:

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limitation, if five or more of the past ten or less tests show toxicity greater than 10 TUc.

[6] A TUc equals 100/NOEL. The NOEL is the no observable effect level, determined from IC, EC, or NOEC values. These terms and their usage in determining compliance with the limitations are defined in the **Attachment B** of this Order. The NOEL shall be based on a critical life stage test using the most sensitive test species as specified by the Executive Officer. The Executive Officer may specify two compliance species if test data indicate that there is alternating sensitivity between the two species. If two compliance test species are specified; compliance shall be based on the maximum TUc value for the discharge sample based on a comparison of TUc values obtained through concurrent testing of the two species.

[7] A test sample showing chronic toxicity greater than 20 TUc represents consistent toxicity and a violation of this limitation if one or more of the past ten or less samples shows toxicity greater than 20 TUc.

[8] The Discharger may, at its option, meet this limitation as total chromium.

STORMWATER RUNOFF ALLOCATION

Constituent	Unit	Monthly Average	Daily Maximum
BOD_5	mg/l	26	48
TSS	mg/l	21	33
COD	mg/l	180	360
Oil & Grease	mg/l	8	15
Phenolic Compounds	mg/l	0.17	0.35
Total Chromium	mg/l	0.21	0.60
Hexavalent Chromium[8]	mg/l	0.028	0.062

BALLAST WATER ALLOCATION

Constituent	Unit	Monthly Average	Daily Maximum
BOD_5	mg/l	26	48
TSS	mg/l	21	33
COD	mg/l	240	470
Oil & Grease	mg/l	8	15
pH	within the range of 6.0 to 9.0		

The total effluent limitation is the sum of the stormwater runoff allocation, the ballast water allocation, and the mass limits contained in B.5. The Discharger shall compute the total effluent limitation (both daily maximum and monthly average) on a monthly basis as shown in Part B of the Self-Monitoring Program.

7. The discharge of Waste 001 containing constituents in excess of the following limitations is prohibited:

Constituent	Unit	Monthly Average	Daily Maximum
Silver	µg/l	--	22.9
Cyanide[9]	µg/l	--	25

[9] The Discharger may, at its option, meet the limit for cyanide as free cyanide, simple alkali metal cyanides,

Constituent	Unit	Monthly Average	Daily Maximum
Tributyltin	µg/l	0.05	--
Alpha-BHC	µg/l	0.13	--
Beta-BHC	µg/l	0.46	--
Gamma-BHC	µg/l	0.63	--
Aldrin	ng/l	1.4	--
Endosulfan	µg/l	--	0.087
Endrin	µg/l	--	0.023
Heptachlor	ng/l	2.1	36
Heptachlor Epoxide	ng/l	1.1	36
Hexachlorobenzene	ng/l	7.7	--
PAHs[10]	µg/l	0.49	150
Pentachlorophenol	µg/l	--	79
Toxaphene	ng/l	2	--

8. The discharge of Waste 001 containing constituents in excess of the following interim limitations is prohibited:

Constituent	Unit	Monthly Average	Daily Maximum
Copper	µg/l	--	37
Mercury	µg/l	0.21	1
Nickel	µg/l	--	53
Selenium	µg/l	--	50
TCDD Equivalents[11]	pg/l	0.14	--
PCBs total[12]	ng/l[13]	0.7	300
Chlordane	ng/l	0.81	40
DDT	ng/l	6	10
Dieldrin	ng/l	1.4	19

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and weakly complex organometallic cyanides. These forms of cyanide shall be measured using the Weak Acid Dissociable Cyanide method described in the most recent edition of Standard Methods, or another method approved by the Executive Officer.

[10] See Attachment D for definitions

[11] See Attachment D for definitions.

[12] See Attachment D for definitions.

[13] ng/l: nanogram per liter.

		Running Annual Average[14]
Selenium	lb/day	1.0
Mercury	lb/month	0.279
Nickel	lb/month	50.7
Copper	lb/month	No net increase above influent raw water sources[15]

C. Stormwater Limitations

1. The discharge of Wastes 003, 004, and 005 containing constituents in excess of the following limits is prohibited:

Constituent	Units	Limitation
Oil & Grease	mg/l	daily maximum of 15
TOC	mg/l	daily maximum of 110
pH	standard units	6.5 to 8.5
Visible oil	---	none observed
Visible color	---	none observed

D. Receiving Water Limitations

1. The discharge shall not cause the following conditions to exist in waters of the State at any place:

   a. floating, suspended or deposited macroscopic particulate matter or foam;

   b. alteration of temperature, turbidity or apparent color beyond present natural background levels;

   c. visible, floating, suspended or deposited oil or other products of petroleum origin;

   d. bottom deposits or aquatic growths; and

   e. toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl or render any of these unfit for human consumption either at levels created in the receiving

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14 Mass limit is based on running annual average mass load. Running annual averages shall be calculated by taking the arithmetic average of the current monthly mass loading value (see sample calculation below) and the previous 11-month' values.

Sample Calculation: If a pollutant X is sampled twice per month, the monthly average daily mass load is: $=\frac{1}{2}(\sum Fi \times Ci)$,

And the monthly mass load is given by:

$=[\frac{1}{2}(\sum Fi \times Ci)] \times (365 \text{ days/year})/(12 \text{ months/year})$

where Fi is the daily average flow rate of the day when the sample was collected, and Ci is the concentration of the pollutant X detected in the effluent.

Compliance of these mass limits will be required starting from the next calendar month upon the adoption of this Order.

15 Compliance with "no net increase" is based on running annual average monthly load. If the data do not show compliance with the no net increase limit, the Discharger shall comply with a running annual average mass limit of 5.8 lbs/month.

waters or as a result of biological concentration.

2. The discharge shall not cause nuisance, or adversely affect beneficial uses of the receiving water.

3. The discharge shall not cause the following limits to be exceeded in waters of the State at any place within one foot of the water surface:

   a. pH: the pH shall not be depressed below 6.5 nor raised above 8.5, nor caused to vary from normal ambient pH levels by more than 0.5 units.

   b. Dissolved Oxygen: the concentration of dissolved oxygen shall not be less than 7.0 mg/l any time, and the median dissolved oxygen concentration for any three consecutive months shall not be less than 80 percent of the dissolved oxygen content at saturation.

   c. Dissolved sulfide: 0.1 mg/l maximum.

   d. Unionized ammonia (as N): annual median 0.025 mg/l
   maximum at any time 0.16 mg/l

4. The discharge shall not cause a violation of any applicable water quality standards for receiving waters adopted by the Board or State Board. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Clean Water Act, or amendments thereto, the Board will revise and modify this Order in accordance with such standards.

E. Provisions

1. Effective Date of Permit
This Order shall serve as a NPDES permit pursuant to section 402 of the Federal Water Pollution Control Act, or amendments thereto, and shall take effect at the end of ten days from the date of hearing provided that the Regional Administrator of the USEPA has no objections. If the Regional Administrator objects to its issuance, this Order shall not become effective until such objection is withdrawn.

2. Permit Modification
Pursuant to USEPA regulations 40 CFR 122.44, 122.62, and 124.5, this Order may be modified prior to the expiration date to include effluent limits for other toxic or pollutants if monitoring results of these pollutants indicate that either reasonable potentials of exceeding the corresponding site-specific water quality objectives or significant amount of these pollutants exist in the discharge resulting in a threat of impacts to the water quality or beneficial uses of Suisun Bay exist.

3. Self-Monitoring Program
This Order includes all items of the attached Self-Monitoring Program as adopted by the Board and as may be amended pursuant to USEPA regulations 40 CFR 122.62, 122.63, and 124.5.

4. Standard Provisions and Reporting
This Order includes all items, except as mentioned otherwise, of the "Standard Provisions

and Reporting Requirements" of August 1993.

5. Nuisance
   Neither the discharge nor its treatment shall create a nuisance or pollution as defined in Section 13050 of the California Water Code.

6. Compliance with Acute Toxicity Effluent Limitations
   Compliance with the acute toxicity limitations in Effluent Limitations B.4.a of this Order shall be evaluated by measuring the survival rate of both fish species of stickleback and rainbow trout in a static renewal 96-hour bioassay. Each test consists of exposing ten fish of each species to undiluted effluent for 96 hours, and each fish represents a single sample. The two fish species shall be tested concurrently. Toxicity tests shall be performed according to protocols approved by the USEPA or equivalent alternatives acceptable to the Executive Officer.

7. Compliance with Chronic Toxicity Limitations
   Definitions of terms used in the chronic toxicity effluent limitations are included in **Attachment B** of this Order. Compliance with chronic toxicity in Effluent Limitation B.4.b of this Order shall be evaluated by measuring the critical life stage toxicity tests for aquatic species as specified in the attached Self-Monitoring Report. **Attachment C** of this Order identifies the Critical Life Stage Toxicity Tests used in the chronic toxicity monitoring.

8. Toxicity Identification Evaluation / Toxicity Reduction Evaluation
   If a violation of the chronic toxicity effluent limitation occurs, the Discharger shall conduct a chronic toxicity reduction evaluation (TRE), which shall initially involve a toxic identification evaluation (TIE). The TIE shall be in accordance with a work plan acceptable to the Executive Officer. The TIE shall be initiated within 30 days of the date of violation. The objective of the TIE shall be to identify the chemical or combination of chemicals that are causing the observed toxicity. The Discharger shall use currently available TIE methodologies. As toxic constituents are identified or characterized, the Discharger shall continue the TRE and take all reasonable steps to determine the source(s) of the toxic constituent(s) and evaluate alternative strategies for reducing or eliminating the constituent(s) from the discharge, and reduce toxicity to the required level. The Board recognizes that chronic toxicity may be episodic, and that identification of causes of chronic toxicity may not be successful in all cases. Consideration of enforcement action by the Board will be based in part on the Discharger's actions in identifying and reducing sources of consistent toxicity.

9. Total Coliform Study
   The Discharger shall submit no later than May 15, 2000 a proposal to the Executive Officer for approval. The proposal shall include details for assessing all potential and probable sources that cause elevated levels of total coliform in the disinfected wastewater. The study should at least cover a period of one hydrologic cycle, and consist of following components:

   a. Review of all available records to determine if there are any leaking underground sewer lines, septic tanks, or other similar infrastructures in the vicinity of the wastewater treatment system;
   b. A recommendation of appropriate monitoring stations in the wastewater treatment and conveyance system to evaluate both total and fecal coliform;
   c. A methodology to collect information substantiating the claim of non-refinery sources of total coliform; and,

d. Management and technical strategies to control and eliminate, if possible and cost-effective, these sources of high levels of total coliform in the disinfected wastewater.

10. Regional Monitoring Program
The Discharger shall continue to participate in the Regional Monitoring Program (RMP) for trace substances in San Francisco Bay in lieu of more extensive effluent and receiving water self-monitoring requirements that may be imposed.

11. Dioxins and Furans Limit Reopener
Pursuant to USEPA regulations 40 CFR 122.44, 122.62, and 124.5, the limitation for TCDD Equivalents specified in this Order may be modified prior to the expiration date to make the requirements consistent with the standards and policies that will be promulgated in the USEPA's CTR and in the State Board's Plans.

12. Screening Phase Compliance Monitoring
The Discharger shall conduct screening phase compliance monitoring in accordance with a proposal submitted to and acceptable to the Executive Officer, as part of its ETCP. The proposal shall contain, at a minimum, the elements specified in **Attachment C** of this Order. The purpose of the screening is to determine the most sensitive test species for subsequent compliance monitoring for chronic toxicity. Screening phase compliance monitoring shall be conducted under either of the following conditions:

a. Subsequent to any significant change in the nature of the treatment plant effluent through changes in sources or treatment, except those changes resulting from reduction in pollutant concentrations attributable to pretreatment, source control, and waste minimization efforts; or,

b. Prior to permit reissuance, except when the Discharger is conducting a TIE/TRE, screening phase monitoring data shall be included in the NPDES permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.

13. Elimination and Reduction of E-005 Discharges
The Discharger shall submit no later than June 15, 2000 a proposal to the Executive Officer for approval. The proposal shall describe efforts and measures to be implemented to eliminate, or reduce if it is not possible to eliminate all, the amount of potentially polluted stormwater runoff from the Avon Refinery and the Terminal. The stormwater runoff discharges are collectively designated E-005. The major pollutant of these discharges is sediment. Other potential pollutants include, but are not necessarily limited to, total petroleum hydrocarbon, oil and grease, metals, and acidic chemicals of unknown source and nature. This provision specifies that the Discharger shall attempt to achieve the above-mentioned goals in the following order:

a. Isolation of potential sources of pollutants from being contact with stormwater runoff (e.g. store drums or equipment/parts under cover);
b. Construction of physical systems and/or structures to collect stormwater runoff, and to redirect for discharge or treatment/discharge through outfalls E-001, E-003 and E-004; and,
c. Construction of physical systems and/or structures to contain stormwater runoff, and to discharge via a single outlet at each location if (b) above is infeasible.

In the proposal, the Discharger shall also include a study plan to investigate, identify, and eliminate the source(s) of low pH stormwater detected in the area U-T6NE near the Chemical Plant; and, the oily runoff found in the area U-T2SW near the vehicle maintenance workshop.

The Discharger shall begin implementing the proposal within 10 calendar days of approval, unless otherwise directed. The proposal may include a time schedule for completion. Progress reports shall be submitted on a quarterly basis if the proposed scope of work will take more than six months to complete.

14. Submittal of Updated Plans

The Discharger shall submit no later than August 1, 2000 a copy of updated Stormwater Pollution Prevention Plan (SWPPP) and Best Management Practices Plan (BMPP) to the Executive Officer for approval. Both the SWPPP and BMPP shall cover the Avon Refinery and the Terminal. The SWPPP shall describe **site-specific** management practices for minimizing stormwater runoff from being contaminated, and for preventing contaminated stormwater runoff from being discharged directly to waters of the State.

The BMPP portion should entail **site-specific** plans and procedures implemented and/or to be implemented to prevent hazardous waste/material from being discharged to waters of the State. The updated BMPP shall be consistent with the requirements of 40 CFR 125, Subpart K, and the general guidance contained in the "NPDES Best Management Guidance Document", USEPA Report No. 600/9-79-045, December 1979 (revised June 1981). In particular, a risk assessment of each area identified by the Discharger shall be performed to determine the potential of hazardous waste/material discharge to surface waters.

For the purpose of the SWPPP and BMPP, the Discharger shall include an updated drainage map for the facility; identify on a map of appropriate scale the areas which contribute runoff to the permitted discharge points; describe the activities in each area and the potential for contamination of stormwater runoff and discharge of hazardous waste/material; and, address the feasibility for containment and/or treatment of the stormwater. The SWPPP and BMPP may include time schedules for the completion of management practices and procedures. The Discharger shall begin implementing the SWPPP and BMPP within 10 calendar days of approval, unless otherwise directed. The SWPPP and BMPP shall then be reviewed by July 1, 2001, and then annually thereafter. Updated information shall be submitted within 30 days of revision.

15. Contingency Plan Update

The Discharger shall submit no later than September 15, 2000 an updated contingency plan to the Executive Officer for approval. The Contingency Plan shall be consistent with the requirements of Board Resolution No. 74-10, and be **site-specific** to the Avon Refinery and the Terminal. The Discharger shall begin implementing the Contingency Plan within 10 calendar days of approval, unless otherwise directed. The contingency plan shall be reviewed at the same time with the SWPPP and BMPP. Updated information shall be submitted within 30 days of revision. Discharging pollutants in violation of this Order where the Discharger failed to develop and implement an approved contingency plan will be the basis for considering such discharge a willful and negligent violation of this Order pursuant to Section 13387 of the California Water Code.

16. Submittal and Implementation of Waste Minimization Plan (WMP)
The Discharger shall submit, no later than May 1, 2000, a WMP acceptable to the Executive Officer for the reduction in the use or generation of pollutants that are listed on the 303(d) list and identified in the Findings 51 and 52. "Waste Minimization" means any action that causes a net reduction in the use of a hazardous substance or other pollutant that is discharged into water and includes any of the following: input change, operational improvement, production process change, or product reformulation. The Discharger shall begin implementation of the WMP within 30 days of the Executive Officer's approval of the WMP.

17. Reporting Requirements for WMP
Progress reports shall be submitted commencing with the Discharger's Self-Monitoring Report that corresponds to three months after implementation begins, and then quarterly thereafter, until implementation is concluded. The annual monitoring report shall include a section that summarizes the implementation progress of the WMP. This section shall include: a discussion of program activities; an evaluation of the effectiveness or deficiencies of the WMP; the resources expended; and, proposed changes to the existing WMP and time schedules. A final report of completion, acceptable to the Executive Officer, shall be submitted within 45 days after all the implementation work has been completed.

18. Submittal of Annual Refinery Throughput Data
The Discharger shall submit annual refinery throughput data to the Executive Officer by February 1 each year. This requirement is based on the consideration that the current refinery throughput is lower than the 150,000 bbl/d, and the Discharger has not been able to submit the actual refinery throughput data since several process units were shut down. Should the data indicate that the actual long-term refinery throughput is significantly lower than the 150,000 bbl/d, the technology-based limits specified in Effluent Limitation B.5 above shall be modified in accordance with the USEPA Effluent Limitation Guidelines and Standards, 40 CFR Part 419 Subpart B.

19. Optional Mass Offset
If the Discharger wishes to pursue a mass offset program, a mass offset plan for reducing 303(d)-listed pollutants to the same receiving waterbody needs to be submitted for Board approval. This Order may be modified by the Board to allow an acceptable mass offset program.

20. Compliance Schedule for Detection-Limited Pollutants
If the analytical methods for some pollutants (e.g. PCBs, TCDD Equivalents) are improved or new method developed which improves (or lowers) the analytical quantification limit beyond those specified in the Self-Monitoring Program, and the Discharger using the new or improved methods finds the above pollutants present at levels above their effluent limits specified in B.7 and B.8, but below the former analytical quantification limits established, the Discharger shall notify the Executive Officer, accelerate monitoring for the pollutant of concern to characterize the discharge, and within 60 days develop and initiate a source identification and reduction investigation acceptable to the Executive Officer. Until this Order is revised, compliance with the above effluent limitations shall be determined at the former analytical quantification limits specified in the Self-Monitoring Program.

21. Signatory and Certification
All applications, reports, or information submitted to the Board shall be signed and certified pursuant to USEPA regulation 40 CFR 122.41(k).

22. Change of Ownership/Business Operation
In the event of any change in control or ownership of the site, business operation, or waste, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to this office. Requirements established in Standard Provisions E.4 of August 1993 shall be complied by the Discharger and the succeeding site owner or operator.

23. Notification of Changes
Pursuant to USEPA regulation 40 CFR 122.42(a) the Discharger must notify the Board as soon as it knows or has reason to believe (1) that it has begun or expect to begin, use or manufacture a toxic pollutant not reported in the permit application, or (2) a discharge of toxic pollutant not limited by this Order has occurred, or will occur, in concentrations that exceed the specified limits in 40 CFR 122.42(a).

24. Consistent Use of Lowest Detection Limits
The Discharger shall consistently use the lowest possible detection limits commercially available to analyze all required chemical parameters in its waste discharges.

25. Rescission of Previous Order
The requirements prescribed by this Order supersede the requirements specified by previous Order Nos. 93-068 and 95-138.

26. Permit Expiration
This Order expires on February 16, 2005, and the Discharger must file a Report of Waste Discharge in accordance with Title 23, Chapter 3, Subchapter 9 of the California Administrative Code, not later than 180 days in advance of such date as application for the reissuance of waste discharge requirements.

The Discharger shall immediately comply with all limitations, prohibitions, and other provisions of this Order upon its adoption by the Board.

I, Lawrence Kolb, Acting Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on February 16, 2000

Lawrence P. Kolb

Dr. Lawrence Kolb
Acting Executive Officer

Attachments:
Figure 1. Site Map
Figure 2. Waste Water Treatment Schematic
Figure 3. Stormwater Drainage Flow Schematic
A. Description of Waste 005 Source Areas and Location Maps
B. Chronic Toxicity Definition of Terms
C. Chronic Toxicity Screening Phase Monitoring Requirements
D. Definition of Terms for Chemical Pollutants
E. Self-Monitoring Program, Parts A (August 1993) and B
F. Standard Provisions, and Reporting Requirements dated August 1993

ATTACHMENT A

Waste 005 Source Areas and E-005 Discharges

The Refinery is divided into six tracts, namely, Tracts 1, 2, 3, 4, 6, and 7. Potential and existing source areas for Waste 005 are designated in Table 1 of the Order. Some of these areas contribute to E-005 discharges whereas others do not. The following description of E-005 discharges and their contributing areas is supplemental to the Order. Information is based on the Discharger's 1994 SWPPP and staff observations during pre-permitting site visits:

Tract 1

U-T1E, located east of the "Clean Water Canal" and the refinery processes, is in Tract 1. U-T1E includes an area where the Coke Pond, coke piles, a pipeline, flares, and inactive soil-covered Solid Waste Management Units (SWMUs) exist. The pipeline has a trench beneath it to hold spills or stormwater. The flares are bermed for the same purpose. A road around the perimeter of Tract 1 is raised and acts as a berm to separate the tract from Hastings Slough. The SWMUs are soil-covered, bermed, and self-contained. Tosco indicated that U-T1E is mostly devoid of industrial or other activities.

Tract 2

There are four source areas in Tract 2, two in the north (U-T2N and U-T2NW) and two in the south (U-T2S and U-T2SW). All source areas border Pacheco Creek.

U-T2N includes an open field between the Environmental Affair Building and the railroad tracks. There is a pipe rack supported by an earthen berm. Although the Discharger uses the berm to provide some containment of stormwater in this area, the berm discontinues and allows runoff to discharge to the creek. This discharge location is referred to as E-005-T2N.

U-T2NW includes part of the parking lot/heliport and the area around and to the south of the Tract 2 Operations Building. There is a long narrow strip of sloped land west of the No. 50 Crude unit that drains directly to the creek. A non-operating saltwater pump station exists on the creek side of the slope. This discharge location is referred to as E-005-T2NW.

U-T2S includes two used equipment reclamation areas that are used to temporarily store miscellaneous equipment and parts for either reuse or disposal. Stormwater from this area flows directly toward the creek. This discharge location is referred to as E-005-T2S.

U-T2SW includes areas around the outdoor equipment storage facility that stores miscellaneous metal part and vehicles, an auto shop, and the western side of the Purchasing and Store House. The discharge of stormwater from this area is referred to as E-005-T2SW.

Tract 3

There are three potential source areas (U-T3N, U-T3SE, and U-T3SW) in Tract 3.

U-T3N includes the entire area surrounding the Bio-Oxidation Pond, the land extending to the unloading dock, and the property north of the tanks between the pond and the "Clean Water Canal". A pipe rack extending the length of U-T3N is elevated and has a ditch beneath it. The pipe rack is bermed at intervals such that the ditch is divided into discrete segments. Under normal conditions, stormwater and potential leaks are contained in the ditch. The Discharger indicates that most of this area is inactive.

U-T3SE is fully bermed and is bordered by the "Clean Water Canal", a pipe rack ditch, and a controlled area. A portion of the area in the northwest contains inactive railroad spurs and a non-operating tank. Additionally, there is a soil-covered SWMU in the northeastern portion in this area. The Discharger indicates that stormwater entering this area may not contribute to E-005 discharge.

U-T3SW receives overflow from the West Canal. It also contains an SWMU. Runoff does not enter Pacheco Creek because it is contained by the canal, the Bio-Oxidation Pond, and raised roads. The Discharger indicates that this area may contribute no E-005 discharges.

Tract 4

There are two source areas (U-T4NW and U-T4SW) in Tract 4. Runoff from the areas between U-T4NW and U-T4SW are collected and conveyed through a series of impoundments and launderers to E-003. Pump stations for the oily water system are located within each of these two areas. The pump stations are graded, bermed, and equipped with catch basins to collect leaks, which are in turn conveyed to the oily system.

U-T4NW contains an inactive SWMU. Runoff from this area that accumulates at the base of the slope along the access road is discharged offsite to the west through three culverts under the access road. The discharge appears to collect in intermittent ditches parallel to Pacheco Creek, where it eventually overflows into the creek. The discharge location is referred to as E-005-T4NW.

U-T4SW contains an impoundment to store runoff for evaporation. When the water level is high, the impoundment can be drained through a pipe. Slope runoff and the pond drainage directly flow to an offsite low point to the west. Under normal conditions, this low point does not drain. The Discharger indicates that it is, however, feasible to have this area drained to Pacheco Creek. The discharge location is referred to as E-005-T4SW.

Tract 6

There are two source areas (U-T6NE and U-T6SW) in Tract 6. The area east of U-T6NE drains to a collection point to the north where it is conveyed to the oily system; it is not a contributor to E-005 discharge. The area west of U-T6NE is adjacent to the Cardox Plant. Flow patterns at the Cardox Plant are to be evaluated.

U-T6NE contains an outdoor storage area west of the Chemical Plant Office; materials stored include pipes, tanks, and miscellaneous equipment. It also includes the head of Hastings Slough. The runoff from this area drains to Hastings Slough and contributes to discharge E-005-T6NE.

U-T6SW includes the southernmost part of Tract 6, and consists of ball playing fields. The Discharger indicates that this area does not contribute to E-005 discharge.

Tract 7

This tract comprises open fields and old playing fields, and is not in industrial service. The Discharger indicates that no exposure occurs, which would require control. The runoff from this tract may not contribute to E-005 discharge.

Amorco Terminal

There are two potential source areas (U-AW and U-AS) at this Terminal.

U-AW is located along the pipeway adjacent to a sand operations trailer. Drainage in the area is

poorly defined, but appears to drain to Carquinez Strait. Due to the sand operation, this area is susceptible to sediment loads from overflows off the controlled pipeway area and from the area around the sand trailer. U-AW is a potential contributor to E-005 discharges.

U-AS, located near the Terminal's south entrance, is a triangular-shape area below a holding pond. It is vacant except for an electric substation and appears to drain offsite toward Carquinez Strait. U-AS is also susceptible to sediment loads from erosion in the southeast finger along the road. It is a potential contributor to E-005 discharge.

Figures A-1 through A-8 show the above areas in all the six tracts and the Terminal.

ATTACHMENT B

DEFINITION
OF
NO OBSERVED EFFECT LEVEL

No observed effect level (**NOEL**) for compliance determination is equal to IC_{25} or EC_{25}. If the IC_{25} or EC_{25} cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.

Effective concentration (**EC**) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing", response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (**LC**) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Karber. EC_{25} is the concentration of toxicant (in percent effluent) that causes a response in 25% of the test organisms.

Inhibition concentration (**IC**) is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal, non-quantal biological measurement, such as growth. For example, an IC_{25} is the estimated concentration of toxicant that would cause a 25% reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as USEPA's Bootstrap Procedure.

No observed effect concentration (**NOEC**) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

ATTACHMENT C

SCREENING PHASE MONITORING REQUIREMENTS

A. The discharger shall perform screening phase compliance monitoring:

1. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to pretreatment, source control, and waste minimization efforts; or

2. Prior to permit reissuance. Screening phase monitoring data shall be included in the NPDES permit application for re-issuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit's expiration date.

B. Design of the screening phase shall, at a minimum, consist of the following elements:

- Use of test species specified in Table C-1 and C-2 (attached), and use of the protocols referenced in those tables, or as approved by the Executive Officer;

- Two stages:

  Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on Table C-3 (attached); and

  Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.

- Appropriate controls; and

- Concurrent reference toxicant tests.

C. The Discharger shall submit a screening phase proposal to the Executive Officer for approval. The proposal shall address each of the elements listed above.

TABLE C-1
CRITICAL LIFE STAGE TOXICITY TESTS FOR ESTUARINE WATERS

SPECIEIS	TEST EFFECT	DURATION	REFERENCE
alga (Skeletonema Costatum) (Thalassiosira pseudonana)	growth rate	4 days	1
red alga (Champia parvula)	number of cystocarps	7-9 days	3
giant kelp (Macrocystis pyrifera)	percent germination; germ tube length	48 hours	2
abalone (Haiotis rufescens)	abnormal shell development	48 hours	2
oyster (Crassostree gigas) mussel (Mytilus edulis)	abnormal shell development; percent survival	48 hours	2
Echinoderms (urchins - Strongylocentrotus purpuratus, S. franciscanus); (sand dollar - Dendraster excentricus)	percent fertilization	1 hour	2
shrimp (Mysidopsis bahia)	percent survival; growth	7 days	3
shrimp (Holmesimysis bahia)	percent survival; growth	7 days	2
topsmelt (Atherinops affinis)	percent survival; growth	7 days	2
silversides (Menidia berylina)	larval growth rate; percent survival	7 days	3

TOXICITY TEST REFERENCES

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for conducting static 96-hour toxicity tests with microalgae. Procedure E 1218-90. ASTM, Philadelphia, PA.

2. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. USEPA/600/R-95/136. August 1995

3. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. USEPA-600/4-90/003. July 1994

TABLE C-2
CRITICAL LIFE STAGE TOXICITY TESTS FOR FRESH WATERS

SPECIES	EFFECT	TEST DURATION	REFERENCE
fathead minnow (Pimephales promelas)	survival; growth rate	7 days	4
water flea (Ceriodaphnia dubia)	survival; number of young	7 days	4
alga (Selenastrum capricornutum)	cell divisions rate	4 days	4

TOXICITY TEST REFERENCE

4. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Third edition. USEPA/600/4-91/002. July 1994

TABLE C-3
TOXICITY TEST REQUIREMENTS FOR STAGE ONE SCREENING PHASE

REQUIREMENTS	RECEIVING WATER CHARACTERISTICS		
	DISCHARGES TO COAST	DISCHARGES TO SAN FRANCISCO BAY[2]	
	Ocean	Marine	Freshwater
Taxonomic Diversity	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish
Number of tests of each salinity type			
Freshwater[1]	0	1 or 2	3
Marine	4	3 or 4	0
Total number of tests	4	5	3

[1] The fresh water species may be substituted with marine species if:

1) the salinity of the effluent is above 5 parts per thousand (ppt) greater than 75% of the time, or

2) the ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.

[2] Marine refers to receiving water salinities greater than 5 ppt at least 75% of the time during a normal water year. Fresh refers to receiving water with salinities less than 5 ppt at least 75% of the time during a normal water year.

ATTACHMENT D

DEFINITION OF TERMS FOR CHEMICAL CONSTITUENTS

Polynuclear Aromatic Hydrocarbons (**PAHs**) shall mean the following constituents, each of which shall be limited individually at 0.49 µg/l as indicated below.

Constituent	Unit	Monthly Average Effluent Limit
Benz(a)Anthracene	µg/l	0.49
3,4-Benzo(b)Fluoranthene	µg/l	0.49
Benzo(k)Fluoranthene	µg/l	0.49
Benzo(g,h,i)Perylene	µg/l	0.49
Benzo(a)Pyrene	µg/l	0.49
Chrysene	µg/l	0.49
Dibenz(a,h)Anthracene	µg/l	0.49
Indeno(1,2,3-cd)pyrene	µg/l	0.49

Polychlorinated Biphenyls (**PCBs**) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260.

TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity equivalence factors (TEFs), as shown in the table below. (Note: These TEFs may be revised if new or updated information is available, and revision is considered appropriate.)

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8-tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
octa CDF	0.001

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

TOSCO CORPORATION
SAN FRANCISCO AREA REFINERY
AT
AVON
MARTINEZ, CONTRA COSTA COUNTY

NPDES NO. CA0004961

ORDER NO. 00-011

CONSISTS OF

PART A (dated August 1993)

AND

PART B

PART B

I. DESCRIPTION OF SAMPLING STATIONS

A. INFLUENT

Station	Description
I-001	At any point in the pipe which delivers raw water to the Refinery, prior to any point of use. The raw water sources are water from on-site wells and Contra Costa Canal. If more than one pipe is involved in supplying raw water, the influent sample shall consist of a flow proportional composite from each of the sources.

B. EFFLUENT

Station	Description
E-001-D1	At any point in the Tract 1 sanitary sewer where adequate disinfection is assured.
E-001-D2	At any point in the Tract 2 sanitary sewer where adequate disinfection is assured.
E-001	At any point in the outfall leading to the deepwater diffuser, where all wastes tributary thereto are present such that the sample is representative of the treated wastewater effluent.
E-003	At any point in the outfall from the Waste 003 separating sump.
E-004	At any point in the outfall from the Waste 004 separating sump.
E-005s	At a point in each source areas resulting in discharges of Waste 005, not more than 5 feet from the point(s) of discharge of Waste 005. Exact sampling point for each discharge area is identified in Table 1 (Attached).

C. RECEIVING WATERS

Station	Description
C-001	At a point in Suisun Bay, located over the geometric center of the deepwater diffusers for Waste 001.
C-003	At a point in each surface waterbody which receives Waste 003, not more than 10 feet from the corresponding point of discharge of Waste 003.
C-004	At a point in each surface waterbody which receives Waste 004, not more than 10 feet from the corresponding point of discharge

	of Waste 004.
C-005s	At a point in each surface water, if applicable, which receives Waste 005. Exact locations are to be determined.

D. RAINFALL

Station	Description
R-1	The nearest official National Weather Service rainfall station or other station acceptable to the Executive Officer.

II. CHRONIC TOXICITY MONITORING AND REPORTING REQUIREMENTS

A. Test Species and Frequency

The Discharger shall collect 24-hour composite samples at E-001 on consecutive days for critical life stage toxicity testing as indicated below:

Test Species	**Frequency**
Atherinops affinis[1]	**Once every three month**

B. Conditions for Accelerated Monitoring

The Discharger shall accelerate the frequency of monitoring to monthly (or as otherwise specified by the Executive Officer) when there is an exceedance of either of the following conditions:

1. Three-sample median value of 10 TUc, or
2. Single-sample maximum value of 20 TUc.

C. Methodology

Sample collection, handling, and preservation shall be in accordance with USEPA protocols. The test methodology used shall be in accordance with the references cited in the Order, or as approved by the Executive Officer. A concurrent reference toxicant test shall be performed for each test.

D. Dilution Series

The Discharger shall conduct tests at 100%, 50%, 25%, 10%, 5%, and 2.5%. The "%" represents percent effluent as discharged. The 100% dilution may be omitted if the marine test species specified in sensitive to artificial sea salts.

E. Routine Reporting

Each toxicity test result for the current reporting period shall include at a minimum:

1. Dates of sampling and test initiation;
2. Test species;

[1] The Discharger may, at discretion, conduct parallel chronic toxicity tests using both Atherinops affinis and Menidia beryllina to help determine which species is more sensitive to the effluent's toxicity. The frequency of testing will remain the same irrespective of whether a single test or parallel tests are performed.

3. End point values for each dilution (e.g. number of young, growth rate, and percent survival);
4. NOEC value(s) in percent effluent;
5. IC_{15}, IC_{25}, IC_{40}, and IC_{50} values (or EC_{15}, EC_{25}... etc.) in percent effluent;
6. TUc values (100/NOEC, $100/IC_{25}$, and $100/EC_{25}$);
7. Mean % mortality and standard deviation after 96 hours in 100% effluent;
8. NOEC and values for reference toxicant test(s);
9. IC_{50} or EC_{50} value(s) for reference toxicant test(s); and
10. Available water quality measurement for each test (e.g. pH, dissolved oxygen, temperature conductivity, hardness, salinity, ammonia).

III. OTHER SELF-MONITORING REPORTING REQUIREMENTS

A. Compliance Summary

The transmittal letter of each self-monitoring report shall include summary tables of (i) chronic toxicity data from at least eleven of the most recent samples; (ii) bioassay acute toxicity data from at least eleven of the most recent samples; (iii) total coliform data from at least five of the most recent samples preceding the current month; and (iv) annual running average mass loads for copper, mercury, nickel, and selenium, respectively. The information in the table summary for the chronic toxicity data shall include the items listed above under Section A item numbers 1, 3, 5, 6, 7, and 8.

B. Reporting Data in Electronic Format

The Discharger shall report all monitoring results in electronic reporting format approved by the Executive Officer. Chronic toxicity data shall be submitted in electronic reporting format specified in "Suggested Standard Reporting Requirements for Monitoring Chronic Toxicity", February 1993, SWRCB. Bioassay acute toxicity raw data shall also be submitted in electronic format. The chronic and acute toxicity test data shall be submitted in high-density double-sided 3.5-inch floppy diskettes, or other electronic format approved by the Executive Officer. Data shall be submitted not later than *February 15, May 15, August 15, and December 15, respectively, of each year.*

C. Dioxin and Furan Data

The Discharger shall report their Dioxin and Furan data using both the ITEF89 and the WHO98 methodologies.

D. Rainfall

The Discharger shall record the rainfall on each day of the month.

E. Visual Observations of Stormwater Discharge

The Discharger shall conduct visual observations of the all stormwater discharge locations on at least one storm event per month that produces a significant stormwater discharge to observe the presence of floating and suspended materials, oil and grease, discoloration, turbidity, and odor. "Significant stormwater discharge" is a continuous discharge of stormwater for a minimum of one hour, or an intermittent discharge of stormwater for a minimum of three hours in a 12-hour period.

F. Form A

The Discharger shall use the method described in attached Form A to determine the stormwater runoff/ballast water allocation (daily & monthly) for its discharge. The allocation results shall be submitted with the monthly self-monitoring report. The daily

maximum allocation must be computed for each day Waste 001 is monitored.

G. Ballast Water Allocations
The Discharger shall meter and record the daily volume of ballast water that was treated and discharged as part of Waste 001 for the reporting period. The 30-day average shall be the sum of the daily values in a calendar month divided by the number of days in that month. Ballast-water allocations shall be calculated by multiplying the volume of ballast water (determined above in section E) by the appropriate concentrations listed under Effluent Limitation B.6 in the Order.

H. Information Related to Organic and Metallic Pollutants
The Discharger shall retain and submit (when requested by the Executive Officer) the following information related to the monitoring of organic and metallic pollutants.

a. Description of sample stations, times, and procedures.
b. Description of sample containers, storage, and holding time prior to analysis.
c. Quality assurance procedures together with any test results for replicate samples, sample blanks, and any quality assurance tests, and the recovery percentages for the internal and surrogate standards.

I. Method Detection Limits
The Discharger shall submit in the monthly self-monitoring report the metallic & organic test results together with the detection limits (including unidentified peaks). All unidentified (non-Priority Pollutants) peaks detected in the USEPA 624 and 625 test methods shall be identified and semi-quantified. Hydrocarbons detected at < 10 microgram per liter (µg/l) based on the nearest internal standard may be appropriately grouped and identified together as aliphatic hydrocarbons, aromatic hydrocarbons, and unsaturated hydrocarbons. All other hydrocarbons detected at > 10 µg/l based on the nearest internal standard shall be identified and semi-quantified.

J. Maps
An updated legible map showing the locations of all ponds, treatment facilities, and points of waste discharge shall be submitted, if changes were made.

V. SCHEDULE OF SAMPLING AND ANALYSIS

A. Sampling Schedule
The schedule of sampling and analysis shall be that given in attached Table 2.

B. Sampling Protocols
Sample collection, storage, and analyses shall be performed according to the latest 40 CFR Part 136 or other methods approved and specified by the Executive Officer.

VI. MODIFICATIONS TO PART A

A. Paragraph C.2.a.
Paragraph C.2.a shall be modified as follows:

"Composite samples of effluent shall be collected on random weekdays and on any day when substantial changes in flow occur during dry weather conditions."

B. Paragraph C.2.d.
The last sentence of Paragraph C.2.d. shall be modified as follows:

> "... the sampling frequency shall be increased to daily until the additional sampling shows that the most recent monthly average is in compliance with the monthly average limit."

C. Paragraphs D.4 and E.3
Exclude paragraphs D.4 and E.3.

D. Paragraph F.4
The first sentence shall be modified as follows:

> "Self-Monitoring Reports shall be filed regularly for each calendar month (unless specified otherwise) and the Board should receive the written report no later than the fifteenth day of the following month..."

I, Lawrence Kolb, Acting Executive Officer, do hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in the Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Board Order No. 00-011.

2. Is effective on the date shown below.

3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the Discharger, and revisions will be ordered by the Executive Officer.

February 16, 2000
Effective Date

Dr. Lawrence Kolb
Acting Executive Officer

Attachments:
Table 1 - E-005 Sampling Locations
Table 2 - Schedule of Sampling, Measurement and Analysis
Form A - Stormwater/Ballast Water Allocation Procedure

TABLE 1 OF SELF-MONITORING PROGRAM, PART B

E-005 SAMPLING LOCATIONS

Station Designation	Description
E-005-T2N	The northwestern end of area in the naturally eroded channel
E-005-T2NW-A	Near the Operations Room in a small naturally eroded channel at the stairs leading down to the pumphouse
E-005-T2NW-B	About halfway between the Operations Room and the eastern boundary of the U-T2NW area.
E-005-T2S-A	Near the chain-link door on the parcel located east of the rail track
E-005-T2S-B	The low point between the scrap transformer storage yard and Foster-Wheeler Cogeneration Plant
E-005-T2SW-A	The south end of the uncontrolled oil storage area outside the Auto Shop
E-005-T2SW-B	The south end of the heat exchanger storage area
E-005-T2SW-C	The southwestern end of the reclamation paddock at the inlet to the culvert
E-005-T4NW	At the easternmost culvert that conveys runoff from this area under the road to the west
E-005-T4SW	The outlet of the pipe that drains the impoundment. The pipe has a locked valve on it and is required to be sampled when there is a discharge from the impoundment.
E-005-T6NE	The northwestern end of the fenced area in the naturally eroded channel that drains to Hastings Slough
E-005-AW	The low point in the area before discharge
E-005-AS	The culvert in the northwestern part of the area

Note: All sampling locations indicated above are approximately only. Exact locations have to be ascertained on site.

TABLE 2 OF SELF-MONITORING PROGRAM, PART B

SCHEDULE OF SAMPLING, MEASUREMENTS, AND ANALYSIS

Station	Constituent	Unit	Sample Type	Frequency of Analysis
E-001	Flow	MGD	Continuous	Continuous
	BOD_5	mg/l Kg/day	Composite	Monthly
	TSS	mg/l Kg/day	Composite	Monthly
	COD	mg/l Kg/day	Composite	Monthly
	Oil & Grease	mg/l Kg/day	Grab [1,2]	Monthly
	Phenolic Compounds	mg/l Kg/day	Composite	Monthly
	Ammonia as N	mg/l Kg/day	Composite	Monthly
	Total Sulfides	mg/l Kg/day	Grab [2]	Monthly
	Total and Hexavalent Chromium	µg/l Kg/day	Composite	Monthly
	Settleable Matter	ml/l/hr	Grab [2]	Monthly
	pH [3]	--	Continuous	Continuous
	Temperature	°F	Continuous	Continuous
	Chlorine Residual	mg/l	Grab [2]	Daily
	Acute Fish Toxicity Test [4]	% Survival	Composite	Weekly
	Chronic Toxicity Test [5]	Critical Life Stage	Composite	Quarterly
	Arsenic [6]	µg/l	Composite	Quarterly
	Cadmium	µg/l	Composite	Quarterly
	Copper	µg/l	Composite	Weekly
	Cyanide [7]	µg/l	Composite	Weekly
	Lead	µg/l	Composite	Quarterly
	Mercury [8]	µg/l	Composite	Monthly
	Nickel	µg/l	Composite	Weekly
	Selenium [9]	µg/l	Composite	Weekly
	Silver	µg/l	Composite	Monthly
	Zinc	µg/l	Composite	Quarterly
	PAHs [10]	µg/l	Composite	Monthly
	Tributyltin [11]	µg/l	Grab [2]	Yearly
	USEPA Method 608 [12]	µg/l	Grab [2]	Yearly
	USEPA Method 624 [13]	µg/l	Grab [2]	Yearly
	USEPA Method 625 [14]	µg/l	Grab [2]	Yearly
	USEPA Method 1613 [15]	pg/l	Grab [2]	Quarterly
	MTBE [16]	µg/l	Grab [2]	Monthly
	Diazinon	ng/l	Grab [2]	Quarterly

E-001-D1 and -D2	Total Coliform [17]	MPN/100 ml	Grab [2]	Daily on Weekdays
E-003	Oil & Grease	mg/l	Grab [2]	On each Occurrence
&	TSS	mg/l	Grab [2]	On each Occurrence
E-004	pH	--	Grab [2]	On each Occurrence
&	TOC	mg/l	Grab [2]	On each Occurrence
E-005s	TPH [18]	mg/l	Grab [2]	When TOC is detected
	Standard Observations [19]	--	--	On each Occurrence [20]
C-001	pH	--	Grab [2]	Quarterly
	D.O.	mg/l	Grab [2]	Quarterly
	Temperature	°F	Grab [2]	Quarterly
	Sulfides [21]	mg/l	Grab [2]	Quarterly
	Unionized Ammonia	mg/l	Grab [2]	Quarterly
	Total Dissolved Solids	mg/l	Grab [2]	Quarterly
	Salinity	mg/l	Grab [2]	Monthly
	Hardness as $CaCO_3$ [22]	mg/l	Grab [2]	Monthly
	Standard Observations	--	--	Monthly
C-003	pH	--	Grab [2]	Coincident with
&	D.O.	mg/l	Grab [2]	each discharge
C-004	Temperature	°F	Grab [2]	from E-003,
&	Unionized Ammonia	mg/l	Grab [2]	E-004 & E-005
C-005s	Standard Observations	--	--	-ditto-
I-001	Copper	mg/l Kg/day	Grab [2]	Weekly [23]

Notes for Table 2:

1. Sampling for oil and grease shall consist of 3 grab samples taken at 2-hour intervals during the sampling day, with each grab being collected in a glass container. The entire volume of each sample shall be composed prior to analysis. Each glass container used for sample collection or mixing shall be thoroughly rinsed with appropriate solvent agents as soon as possible after use, and the solvent rinsate shall be added to the composite wastewater sample for extraction and analysis.

2. Grab samples shall be collected coincident with samples collected for the analysis of the regulated parameters. In addition, the grab samples must be collected in glass containers. Polycarbonate containers may be used to store tributyltin samples.

3. Daily minimum and maximum pH shall be reported.

4. Rainbow trout and three-spine stickleback are to be tested to pursuant to Effluent Limitation B.4.a. The tests shall be parallel 96-hour flow through bioassays. The Discharger shall perform the tests according to protocols approved by the USEPA, State Board, published by the American Society for Testing and Materials (ASTM), or American Public Health Association.

5. Critical Life Stage Toxicity Test shall be performed and reported in accordance with Chronic Toxicity Requirements specified in Sections II and III of this Self-Monitoring Program. .

6. Arsenic must be analyzed by atomic absorption, gaseous hydride procedure (USEPA Method 206.3/Standard Method No. 303E). Alternative methods of analysis must be approved by the Executive Officer.

7. The Discharger may, at their option, analyze for cyanide as Weak Acid Dissociable Cyanide using protocols specified in Standard Method No. 4500-CN-I, or equivalent alternatives in latest edition. Alternative methods of analysis must be approved by the Executive Officer.

8. Mercury must be analyzed by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescene Spectrometry (USEPA Method 1631), with measuring capability of detecting concentration on the order of 0.5 nanogram per liter or lower Sampling for mercury analysis shall comply with USEPA Method 1669. Alternative methods of analysis must be approved by the Executive Officer.

9. Selenium must be analyzed only by the atomic absorption, gaseous hydride procedure (USEPA Method 270.3/ Standard Method No. 303E). Alternative methods of analysis must be approved by the Executive Officer.

10. Polynuclear aromatic hydrocarbons (PAHs) shall be analyzed using the latest version of USEPA Method 610 (8100 or 8310). Samples must be collected in amber glass containers for the analysis of the regulated parameters. The Discharger may use an automatic sampler that (i) incorporates glass sample containers, and (ii) keeps the samples refrigerated at 4°C and protected from light during compositing. The 24-hour composite samples may consist of eight grab samples collected at 3-hour intervals. The analytical laboratory shall remove flow-proportioned volumes from each sample vial or container for the analysis. Alternative methods of analysis must be approved by the Executive Officer.

11. To determine Tributyltin, the Discharger shall use GC-FPD or an USEPA approved method;

the method shall be capable of speciating organotins and detecting concentrations at low limits on the order of 5 nanograms per liter (ng/l). Alternative methods of analysis must be approved by the Executive Officer.

12. Organochlorine and other Organohalide Pesticides and Polychlorinated Biphenyl Toxic Pollutants shall be analyzed using the latest version of USEPA Method 608 (or 8080). Alternative methods of analysis must be approved by the Executive Officer.

13. Volatile Organic Toxic Pollutants shall be analyzed using the latest version of USEPA Method 624. Alternative methods of analysis must be approved by the Executive Officer.

14. Acid and Base/Neutral Extractable Organic Toxic Pollutants shall be analyzed using the latest version of USEPA Method 625. Alternative methods of analysis must be approved by the Executive Officer.

15. Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans shall be analyzed using the latest version of USEPA Method 1613A; the method shall be capable of detecting concentrations on the order of picogram per liter or lower. Alternative methods of analysis must be approved by the Executive Officer.

16. MTBE (Methyl tertiary-Butyl-Ether) shall be prepared, analyzed and characterized by using the latest version of USEPA Method 624. Alternative methods of analysis must be approved by the Executive Officer.

17. When replicate analyses are made of a coliform sample, the reported result shall be the arithmetic mean of the replicate analysis.

18. Total Petroleum Hydrocarbons for gasoline and diesel shall be prepared, analyzed and characterized by using the latest version of USEPA Method 8015M. Alternative methods of analysis must be approved by the Executive Officer.

19. Standard observations for stormwater discharge include at least visible color and visible oil. Standard observations for receiving water include all those for the determination of compliance with the receiving water limitations D.1 through D.4 of the Order.

20. Receiving water analysis for sulfides should be run when dissolved oxygen is less than 2.0 mg/l.

21. Hardness shall be determined using the latest version of USEPA Method 130.2. Alternative methods of analysis must be approved by the Executive Officer.

22. Each occurrence shall refer to "significant stormwater discharge" on at least one storm event per month. These are continuous discharges of stormwater for a minimum of one hour, or an intermittent discharge of stormwater for a minimum of three hours in a 12-hour period.

23. The I-001 sample shall consist of a flow-weighted composite of four grab samples, taken at 6-hour intervals, from each raw water influent source to the Avon Refinery.