

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER WQO 2002 - 0011

In the Matter of the Petitions of
**CHEVRON U.S.A. INC., WESTERN STATES PETROLEUM ASSOCIATION,
COMMUNITIES FOR A BETTER ENVIRONMENT, AND
BAY AREA CLEAN WATER AGENCIES**

For Review of Waste Discharge Requirements
Order No. 01-067 [NPDES No. CA0005134]
for Chevron Richmond Refinery, Richmond Plant

Issued by the
California Regional Water Quality Control Board,
San Francisco Bay Region

SWRCB/OCC FILES A-1395, A-1395(a), A-1395(b), AND A-1395(c)

BY THE BOARD:

On June 20, 2001, the San Francisco Bay Regional Water Quality Control Board (Regional Board) adopted Waste Discharge Requirements (WDR) Order No. 01-067, reissuing the National Pollutant Discharge Elimination System (NPDES) permit for the Chevron Richmond Refinery. Petitions to the State Water Resources Control Board (State Water Board or Board) were filed by Chevron U.S.A., Inc. (Chevron), Western States Petroleum Association (WSPA), Bay Area Clean Water Agencies (BACWA),¹ and Communities for a Better Environment (CBE), all challenging various aspects of the permit. In this Order, the State Water Board remands in part WDR Order No. 01-067 to the Regional Board for revisions in accordance with the findings and conclusions in this order, and dismisses in part the petitions.²

I. BACKGROUND

The Regional Board adopted WDR Order No. 01-067 on June 20, 2001, authorizing Chevron to discharge wastewater to the San Francisco Bay and San Pablo Bay. The

¹ Issues raised by BACWA are addressed in this Board's Order WQO 2002-0012, (East Bay Municipal Utility District, hereinafter "EB MUD,") also adopted today.

² All parties have asked to supplement the administrative record with additional evidence or incorporation of briefs, submissions and documentation from other matters. Except to the extent that such submissions were filed in response to Order No. WQO 2002-0012 (East Bay MUD), these requests are denied.

discharge was previously regulated by WDR Order No. 92-111, as amended by the Regional Board on September 17, 1997. Order 92-111, as amended, continued in effect past the expiration date in accordance with NPDES and state regulations until Order 01-067 was adopted.

The Chevron facility is composed of several business enterprises. The Chevron Richmond Refinery manufactures various petroleum products. The refinery is classified as an integrated refinery by the United States Environmental Protection Agency (US EPA). General Chemical Corporation manufactures sulfuric acid and oleum. Chevron Chemical Company (CCC) also operates two facilities that were formerly used in the manufacture or formulation of pesticides and other products. With the exception of CCC, the process wastewater from the facilities described above is combined into one waste stream, and this waste stream discharges, after treatment, through outfall E-001. No wastewater streams from the CCC facility have been discharged through E-001 since 1996. Storm water and other lesser wastewater sources are also part of the E-001 discharge. There are 23 wastewater outfalls at the facility, 22 of which (not including E-001) discharge primarily storm water, along with some non-process steam condensate and groundwater seepage. The issues raised in the petitions relate solely to wastewater outfall E-001, hence there will be no further discussion of the other 22 outfalls. Outfall E-001 discharges to San Pablo Bay.

The petitions challenging the Chevron permit raise many issues involving the implementation of the California Toxics Rule (CTR) and the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (2000) (Implementation Policy or Policy). The CTR was issued by US EPA in June of 2000, and sets water quality criteria for priority pollutants in California's inland surface waters and enclosed bays and estuaries.³ The State Board adopted the Implementation Policy to implement the new CTR criteria in individual permits. Background on NPDES permitting, the CTR, the Implementation Policy, and events leading to the current regulatory structure was extensively discussed in this Board's Order WQ 2001-06 (Tosco).⁴

San Pablo Bay is listed as having impaired water quality on the US EPA 303(d)⁵ list for a number of pollutants. The pollutants listed as causing impairment are chlordane,

³ 40 C.F.R. § 131.38.

⁴ See, State Board Order WQ 2001-06, at pp. 5 – 15.

⁵ 33 U.S.C. § 1313(d).

copper, DDT, diazinon, dieldrin, dioxin compounds, furan compounds, exotic species, mercury, nickel, PCBs, dioxin-like PCBs, and selenium. The 303(d) listings for chlordane, DDT, dieldrin, dioxin and furan compounds, and dioxin-like PCBs were made by the US EPA, while the other pollutants were listed by the State Water Board. The Central San Francisco Bay is listed as impaired by the same pollutants, with the exception of nickel.

An interim sport fish advisory for San Francisco Bay fish was issued by the Office of Environmental Health Hazard Assessment (OEHHA) in 1994.⁶ The advisory was based on the analysis of fish tissue from various species of sport fish caught in several locations in the San Francisco Bay. Fish tissue analysis found that levels of PCBs, dioxins, chlordane, the DDT group (DDT, DDE, and DDD), dieldrin, and methylmercury exceeded levels of potential concern and were high enough to warrant more investigation. These pollutants are persistent in the environment and may be taken up by fish for many years. The sport fish advisory remains in effect to date.

II. CONTENTIONS AND FINDINGS⁷

A. Denial of Dilution Credits

Contention: In calculating effluent limitations, a Regional Board may find that the receiving water can amply dilute the discharge such that water quality criteria can be exceeded without causing adverse effects to the entire water body. If the Regional Board so finds, it may designate a mixing zone, a limited volume of receiving water allocated for mixing with a wastewater discharge. This mixing zone is reflected in effluent limitation calculations as a dilution credit, and the availability of dilution is generally described as assimilative capacity. For Chevron's permit, the Regional Board assumed no assimilative capacity for 303(d)-listed bioaccumulative pollutants, and therefore denied dilution credit when calculating effluent limitations.⁸ Chevron⁹ contends that the Regional Board thereby improperly adopted and

⁶ Although there are numerous references in the administrative record to the "state advisory on fish consumption," the OEHHA fish advisory itself does not appear in the record. This document is hereby added to the record.

⁷ This Order does not address all of the issues raised by the petitioners. Some of the issues raised by BACWA are discussed in Order No. WQO 2002-0012, (EBMUD), also being adopted today. The Board finds that the issues that are not addressed are insubstantial and not appropriate for State Water Board review. (See *People v. Barry* (1987) 194 Cal.App.3d 158, [239 Cal.Rptr. 349], Cal. Code Regs., tit. 3, § 2052.)

⁸ The pollutants denied a dilution credit include PCBs, toxaphene, mercury, selenium, aldrin, chlordane, 4,4'-DDT, 4,4'-DDE, 4,4'-DDD, dieldrin, and dioxin/furan equivalents.

implemented a new policy of denying mixing zones for all 303(d)-listed bioaccumulative compounds.

Finding: Although the Regional Board's action did not constitute adoption of a new policy requiring amendment of the Basin Plan,¹⁰ we agree that the Regional Board inappropriately failed to explain the basis for its determinations as to assimilative capacity and dilution credit. Analysis of these issues also calls into question the Regional Board's selection of monitoring stations to determine ambient background concentrations of the pollutants regulated in the Chevron permit. The Regional Board must justify its failure to use the closest monitoring stations, as directed by the Implementation Policy.

Chevron objects to the Regional Board's denial of dilution credits for 303(d)-listed bioaccumulative pollutants. The Regional Board found that assimilative capacity could not be quantified, citing uncertainty associated with the representativeness of the appropriate ambient background data.¹¹ The Regional Board does not elaborate on the reasons for uncertainty, other than indicating that assimilative capacity is highly variable due to the complex hydrology of the receiving water. All of the pollutants denied dilution credit, with the exception of toxaphene, aldrin, 4,4'-DDE, and 4,4'-DDD, are 303(d)-listed as pollutants impairing the San Pablo Bay hydrologic unit and likewise, the adjacent Central San Francisco Bay hydrologic unit. There is evidence of actual impacts from most of these pollutants, but the permit and fact sheet do not cite relevant studies of fish tissue from monitoring stations in the bay.

As set forth more fully in this Board's Order No. WQO 2002-0012 (East Bay Municipal Utility District, hereinafter "EB MUD," also adopted today) the Regional Board has broad discretion to deny or limit dilution credit.¹² Where there is evidence of adverse effects on beneficial uses from bioaccumulation, denial of dilution credit is appropriate. Where there is

⁹ Petitions filed by Chevron and WSPA are identical as to those issues WSPA addresses. WSPA joins in Chevron's contentions regarding sections II.A, II.B, II.C and II.D of this order. WSPA presented no other arguments in their petition.

¹⁰ Chevron argues in sections II.A, II.B, II.C and II.E that the Regional Board inappropriately instituted new policies requiring amendment of the Basin Plan in accordance with the Administrative Procedure Act, Cal. Gov. Code, sec. 11340 et. seq. We find no basis to conclude that these actions constitute new policies, but are rather interpretations and conclusions contained in a single permit.

¹¹ Permit, Finding 30.

¹² Implementation Policy § 1.4.2.

uncertainty as to the pollutant's bioaccumulative effects, the Regional Board may properly find that no assimilative capacity exists and deny dilution credit consistent with the direction set forth in section 1.4.2 of the Implementation Policy, but the discharger must be allowed to present evidence demonstrating otherwise. In either case, the findings must reflect the basis for granting or denying dilution credit. The Regional Board's findings in the Chevron permit do not adequately explain the basis for its conclusions as to assimilative capacity and dilution credit. On remand, the Regional Board should reconsider its findings on dilution credit in accordance with the conclusions set forth herein and in the EB MUD order.

In making its determinations as to assimilative capacity, the Regional Board should consider all available data, including fish tissue studies, water column concentrations, and other relevant information. Although Chevron does not raise this point, we note that the Regional Board has not used the monitoring stations closest to the discharge in determining background water column concentrations. The fact sheet states that background values were determined using ambient monitoring data from Regional Monitoring Program ("RMP") stations at Yerba Buena Island and Richardson Bay.¹³ Selection of these monitoring stations does not appear to best represent ambient background conditions, and is contrary to directions provided in the Implementation Policy.

Discharge E-001 is in the vicinity of the narrows dividing San Pablo Bay and Central San Francisco Bay north of the Red Rock station. Sections 1.4.3.1 and 1.4.3.2 of the Implementation Policy state that preference should be given to ambient water column concentrations measured immediately upstream or near the discharge, but not within an allowed mixing zone for the discharge. The Policy also allows the Regional Board discretion to consider if any samples are invalid for use as applicable data due to evidence that the sample is not representative of the ambient receiving water column that will mix with the discharge. In the vicinity of Discharge E-001, the nearest deepwater RMP monitoring stations are Red Rock (station BC60) and Pinole Point (station BD30). Red Rock station is about 3 miles distant in Central San Francisco Bay and Pinole Point station is about 4½ miles distant in San Pablo Bay. No explanation was offered why these monitoring stations would not best represent ambient background that would mix with the discharge during ebb and flood tides.

¹³ WDR Order 01-067, Fact Sheet, at p. 15.

The Yerba Buena Island and Richardson Bay stations, which the Regional Board relied upon, are farther away from the discharge than Red Rock station and do not account for ebb tide flows that likely draw water from Carquinez Strait or San Pablo Bay to mix with the discharge. The Implementation Policy does allow the Regional Board discretion to determine background concentrations specifically for each water body, but the Richardson Bay station is not in the main channel of Central San Francisco Bay and the Yerba Buena Island station is at the boundary between Central San Francisco Bay and Lower San Francisco Bay.

The Regional Board should have determined ambient background concentration based on direction provided in section 1.4.3 of the Implementation Policy. Background data is not applicable if it is not representative of the ambient receiving water column that will mix with the discharge. Unless the Regional Board can support the stations they selected as best representing the ambient background concentration that will mix with the discharge, closer stations such as Red Rock and Pinole Point should be selected for determination of background. On remand, the Regional Board should use the Red Rock and Pinole Point stations, or explain why use of the other stations are consistent with the Policy.

B. Determination of Infeasibility

Contention: The Regional Board found that Chevron had not demonstrated infeasibility of compliance with final limits for certain non-303(d)-listed pollutants, and therefore refused to adopt compliance schedules for those pollutants. To determine feasibility of compliance, the Regional Board used a method that considered the discharger's past performance. Chevron argues that that method is flawed and that the Regional Board should have instituted a system for determining compliance that will estimate and account for future performance.

Finding: Compliance schedules are a discretionary option available to the Regional Board. The Implementation Policy provides that a compliance schedule may be granted where an existing discharger demonstrates that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion.¹⁴ Infeasibility is defined as "not capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal,

¹⁴ Implementation Policy, § 2.1.

social, and technological factors.”¹⁵ While the method used by the Regional Board to evaluate the feasibility of immediate compliance with applicable criteria did incorporate some allowance for variability of effluent quality in the future, it did not use a normal statistical procedure.

To determine feasibility of compliance, the Regional Board compared the observed maximum effluent concentration (MEC) from the facility to the Average Monthly Effluent Limitation (AMEL). Where the MEC was less than the AMEL, the Regional Board concluded that compliance is feasible. Chevron’s monitoring data showed compliance with all limits for which a compliance schedule was denied. The Regional Board used three years of data, finding no exceedances of the subject limits.

Chevron contends that the Regional Board’s method for determining feasibility is flawed because the use of past performance data underestimates the true range of data over time, especially where the data set is limited. Chevron argues that a statistical analysis of the distribution of available data must be used to estimate future treatment performance in determining whether or not compliance is feasible.

We agree. In this Board’s Order WQ 2001-06 (Tosco), we noted the potential problems associated with calculating limits based upon small data sets because the maximum observed value may not be truly representative of the full range of data.¹⁶ This problem also applies to evaluation of current performance in order to determine feasibility of compliance with final limits. On remand, feasibility of compliance should be re-examined using statistical methods, as illustrated in the Tosco order.¹⁷ The Regional Board should develop frequency distributions from available representative data and use those distributions to calculate the feasibility of compliance.

C. Pooling of Data

Contention: The Regional Board calculated an interim performance-based limit for mercury by using data from a number of Bay Area refineries. Chevron argues that the Regional Board was required to use only Chevron’s data, and that the use of pooled mercury data to calculate Chevron’s interim limit is inappropriate.

¹⁵ Policy, Appendix 1.

¹⁶ State Board Order 2001-06, at p. 32.

¹⁷ *Ibid.*

Finding: The Regional Board believed there was inadequate data from the Chevron facility alone to calculate an interim performance-based limit for mercury. The interim concentration limit for mercury of 75 nanograms per liter was calculated using valid statistical procedures that resulted in a representative analysis of current performance, based on pooled data from various refineries in the area. The reason there was inadequate data from Chevron is that it began using ultra clean sampling methods only recently, and the earlier sampling methods are not reliable.

Bay area refineries began using improved analytical methods for measuring low concentrations of mercury in January 2000. Each refinery had about 16 effluent sampling results available when the effluent limits for the Chevron permit were developed. The Regional Board used the combined results to set interim, performance-based limits for the Chevron refinery. Chevron argues that the Regional Board should not have used data from other facilities.

Chevron claims that their effluent quality is highly variable due to many factors, some of which are uncontrollable. Effluent limitations can be developed with a limited data set; but statistical analyses using small data sets are more prone to error than analyses using large data sets. The Tosco order directed the Regional Board to “develop frequency distributions from available representative data and use those distributions to calculate effluent limitations” when analysis of a small data set might result in interim limits that have a high probability of being exceeded.¹⁸ It further concluded that the Regional Board had discretion in setting the percentiles or number of standard deviations, “based on balancing the risk of a violation with the need to protect the bays’ water quality” when setting interim mass limits.¹⁹ Faced with a limited set of representative data from Chevron and the need to protect the quality of a 303(d)-listed water body, the Regional Board analyzed data from the five Bay area refineries to determine if the pooled data represented a single population.²⁰

If data is obtained from a single population, the data will reflect trends of the entire population, regardless of whether the data is from an individual or a group of individuals. One of the primary objectives of statistical science is to enable one to infer a generalization about

¹⁸ SWRCB Order WQ 2001-06, at p. 32.

¹⁹ *Id.*

²⁰ See, San Francisco Bay Regional Water Quality Control Board, Staff Report on Statistical Analysis of Ultraclean Mercury Data from San Francisco Bay Area Refineries, June 13, 2001.

a population without having an infinite data set. Thus, the use of pooled data in general is statistically valid. The Regional Board analyzed the pooled data instead of Chevron's individual data because it found that a larger data set would more accurately account for effluent variability. The pooled Bay area refinery data was used to calculate the mercury concentration limit, while only Chevron's effluent data was used to calculate the mass limit.

Regional Board staff performed a detailed analysis to determine if the pooled data was representative of the effluent quality of the individual dischargers in the pool.²¹ The conclusion of this analysis was that the discharges from the various refineries were sufficiently similar to proceed with calculating a refinery interim limit that would apply to all five of the refineries pending completion of the mercury TMDL. The limit from the pooled data was calculated as the average plus three standard deviations.

Older data from Chevron may not accurately represent current facility performance because the detection limit was much higher using prior sampling techniques. The Regional Board properly used only the more accurate ultra-clean data in calculating the performance-based concentration limit. Pooling the data from different refineries was a reasonable method of expanding the available data to determine an appropriate limit.

Review of the ultra-clean data set shows that Chevron is complying with the limit imposed by the Regional Board, and is unlikely to exceed the pooled-data limit under normal operating conditions. The Chevron-only ultra-clean limit calculated as the average plus four standard deviations is only slightly higher than the pooled-data limit.

D. Limits for Non-detected Compounds

Contention: Chevron contends that past pesticide manufacturing, without other evidence of discharge, does not provide a basis for imposing limits on non-detected compounds.

Finding: The Regional Board found that Chevron's discharge had reasonable potential to cause or contribute to exceedances of water quality objectives for pesticides even where the pesticides were not detected in Chevron's effluent. The Regional Board based these

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²¹ *Id.*

findings upon past pesticide manufacturing at one of the facilities at the Chevron site.²² We find that the record does not support a finding of reasonable potential for these pesticides based upon past pesticide manufacturing.

With the exception of heptachlor epoxide, the pesticides limited in the permit had not been detected in Chevron's effluent.²³ Pesticide manufacturing had previously occurred at the Chevron Chemical Company (CCC) facility, although the permit does not indicate that any effluent or storm water from the CCC facility is included in Chevron's discharge through outfall E-001. The General Chemical Corporation (GCC) discharges through Chevron's outfall, but there is no indication that the GCC facility manufactured the pesticides at issue.

The Regional Board relied on provisions in the Implementation Policy allowing consideration of "other information" to determine if an effluent limitation is required.²⁴ However, the additional information relied upon here is insufficient to support the Regional Board's conclusion. Past manufacturing of pesticides does not establish the reasonable potential for causing or contributing to an exceedance of water quality objectives if the facility where the manufacturing took place has no discharge through which remaining pesticides could reach receiving waters.

Current analytical methods are unable to detect these compounds at their respective water quality objective concentrations. As a result, any reliable detection would indicate an exceedance of the water quality objective. The Implementation Policy directs that effluent limitations are required where there have been no detections, but reported detection limits are equal to or greater than water quality objectives and detected ambient background

²² The pesticides for which the permit imposed limits are: aldrin, A-BHC, chlordane, DDT, DDE, DDD, dieldrin, alpha-endosulfan, beta-endosulfan, endrin, G-BHC, heptachlor, heptachlor epoxide, and toxaphene. See Permit, Finding 28.c. The permit finding, which refers to past and present activities, also lists a number of polynuclear aromatic hydrocarbon (PAH) compounds, including benzo(a)anthracene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, heptachlorobenzene and indeno(1,2,3cd)pyrene. Because these compounds are not pesticides, the permit findings should more clearly reflect their basis for reasonable potential.

²³ Chevron states that the detection of heptachlor epoxide was flagged by the laboratory as anomalous due to a difference of greater than 50 percent between the original sample analysis and the confirmation analysis. This would indicate that the validity of the sample result is questionable.

²⁴ The Policy provides that: "Information that may be used includes: the facility type, the discharge type, solids loading analysis, lack of dilution, history of compliance problems, potential toxic impact of the discharge, fish tissue residue data, water quality and beneficial uses of the receiving water, CWA 303(d) listing for the pollutant, the presence of endangered or threatened species or critical habitat, and other information." Policy, § 1.3.

concentrations of the pollutant exceed water quality objectives.²⁵ Therefore, changes to monitoring stations used for determination of ambient background conditions in the receiving water, as directed in section II.A., may require reconsideration of the reasonable potential analysis for these compounds.

E. Saltwater vs. Freshwater Parameters

Contention: The CTR excludes certain waters from application of the CTR criteria, instead directing that Basin Plan objectives continue to apply to those waters. For excluded objectives, the Regional Board nonetheless used the CTR definition to determine whether the waters in question were freshwater or saltwater. Chevron argues that the Basin Plan definition should instead be used.

Finding: This Board agrees that it is appropriate to use the CTR definitions only for CTR criteria. Accordingly, the permit should be revised to reflect objectives for marine waters for the applicable parameters.

The CTR contains a footnote that excludes certain waters from coverage by the CTR criteria. That footnote states:

“[c]riteria apply to California waters except for those waters subject to objectives in Tables III-2A and III-2B of the San Francisco Regional Water Quality Control Board’s 1986 Basin Plan, that were adopted by the SFRWQCB and the State Water Resources Control Board, approved by EPA, and which continue to apply.”²⁶

By this language, the CTR effectively “promulgates around” certain objectives already established in the San Francisco Regional Board’s Basin Plan.

Chevron contends that because certain of the CTR objectives do not apply, that the definitions used in the CTR should not apply for the parameters in question. The Basin Plan directs that “[m]arine effluent limitations shall apply to discharges to waters with salinity greater than 5 parts per thousand at least 75 percent of the time in a normal water year”²⁷ Under this definition, Chevron claims, the receiving waters are marine waters and any limits must be calculated based on the objectives for marine waters rather than those for freshwater.

²⁵ Implementation Policy, sec. 1.3. See also, State Board Order 2001-06, at p. 37.

²⁶ 40 C.F.R. § 131.38(b)(1), footnote b.

²⁷ Water Quality Control Plan for the San Francisco Bay Basin (1995), at p. 4-13.

The Regional Board concluded that the Basin Plan provision was inapplicable to the parameters in the permit and used the CTR definition, which resulted in use of freshwater criteria, even for the parameters described in CTR Footnote b, above. The CTR presents definitions for freshwater and saltwater in the following manner: “The freshwater and saltwater aquatic life criteria in the matrix in paragraph (b)(1) apply as follows:”²⁸ The provision then defines the parameters for salinity. Because the federal regulation explicitly states that these definitions apply to the criteria contained within it, the Regional Board should not have used the federal definition where the federal criteria do not apply. The CTR directs the use of Basin Plan objectives for the so-called “footnote b” parameters. It is therefore appropriate to select freshwater or saltwater definitions in accordance with the Basin Plan rather than the CTR. If the receiving water meets the definition of marine waters set forth in the Basin Plan, the marine objectives apply.

F. Dioxin Limits

Contention: Chevron argues that the Regional Board improperly imposed limits for seventeen dioxin congeners. Only one congener has been detected in the refinery’s effluent, and Chevron contends that a limit is inappropriate for those congeners not detected. Because the CTR does not regulate all dioxin congeners, Chevron also disagrees with the Regional Board’s method of calculating the dioxin limits based upon a narrative objective in the Basin Plan.

Finding: The Regional Board appropriately applied the Basin Plan narrative objective for bioaccumulation of toxic pollutants in finding reasonable potential for dioxin and furan congeners not regulated by the CTR. The interim limit imposed by the Regional Board is not a water quality-based effluent limitation and may appropriately be based on the prior permit limit.

San Francisco Bay, including San Pablo Bay, has a 303(d) listing for dioxin compounds. The specific compounds included in the listing are 2,3,7,8-TCDD, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDD, and OCDD. San Francisco and Pablo Bay are also 303(d)-listed for furan compounds. The specific compounds included in the listing are 2,3,7,8-TCDF, 1,2,3,7,8-PcCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 2’,3,4,6,7,8-HxCDF,

²⁸ 40 C.F.R. § 131.38(c)(3).

1,2,3,4,7,8,9-HpCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF. Both the dioxin compounds and the furan compounds are congeners of the 2,3,7,8-TCDD form of dioxin.

A congener is something that resembles another thing in nature or action. Dioxin congeners have similar molecular structures, and are extremely toxic even in tiny quantities. The toxicity of the congeners differs from one another. The U.S. EPA published toxic equivalency factors (TEFs) for 17 of the dioxin congeners. Dioxin TEFs for 2,3,7,8-TCDD are published in Table 4 of the Implementation Policy. Most of the congeners, although highly toxic, are less toxic than 2,3,7,8-TCDD. The toxic equivalence of all dioxins present in a sample would be determined by multiplying the measured concentration of each detected congener by its respective factor, then summing the total of all results.

“TEF” stands for toxic equivalency factor. “TEQ” stands for toxic equivalency quantity, and it means the sum of the toxicity of all of the detected congeners in a sample. The interim effluent limit in the permit allows for discharge of a maximum concentration of 0.1 pg/l TCDD equivalents (TEQs). The permit categorizes TCDD equivalents by their isomer groups, as listed in permit Attachment D. The TEFs are the same as those listed in Table 4 of the Implementation Policy.

The US EPA set criteria for only one dioxin congener in the CTR. The human health criteria set by the CTR for ocean discharges of 2,3,7,8-TCDD is 0.000000014 µg/l or 0.014 pg/l.²⁹ Authority for the Regional Board’s regulation of 2,3,7,8-TCDD equivalents is contained in the Basin Plan narrative toxicity objective for bioaccumulation. Applicable NPDES regulations, which California has incorporated by reference, set forth specific procedures for establishing effluent limitations based on narrative water quality criteria.³⁰ The State Board has previously approved the use of numeric effluent limitations to implement narrative water quality objectives, as long as appropriate findings are included.³¹ For Chevron, the permit findings specify that a final limit for dioxins will be based on the waste load allocated to Chevron pursuant to a TMDL not yet developed. Therefore, the Regional Board included a compliance schedule and imposed an interim limit. Although Chevron argues that a “translator mechanism”

²⁹ 40 C.F.R. § 131.38(b)(1).

³⁰ 40 C.F.R § 122.44(d)(vi).

³¹ State Board Order WQ 95-5, at pp. 8-11. See also, State Board Order 95-4.

is necessary for implementation of a narrative objective, an interim limit does not require such a translator.³²

Chevron's feasibility analysis states that dioxin is an unintended byproduct of oil refining and that dioxin is known to form during the regeneration of catalyst in catalytic reformers.³³ Chevron's statements do not explain which dioxin congeners are likely to form during the process, and it is unlikely that this could be accurately predicted. Chevron's wastewater effluent is routed through granulated activated carbon (GAC). GAC is effective at removing particulate matter from wastewater because it has a high surface area, and particles tend to adhere to the carbon surface. No treatment process is 100 percent effective. The Record does not state if annual dioxin monitoring has been conducted during catalyst reforming. Other refinery processes may result in dioxins formation if chlorine, oxygen, hydrocarbons, and heat are combined.

Annual dioxin analysis of Chevron's effluent was conducted during the period from 1995 to 2000.³⁴ Chevron reported a single detection of a dioxin congener during this period. In 1997, the OCDD congener was detected at an estimated concentration of 33 pg/l.³⁵ Multiplying the estimated concentration of 33 pg/l by the applicable toxicity factor of 0.0001 results in a TEQ of 0.0033 pg/l. The allowed 10:1 dilution was incorporated into the effluent limit. This analytical result indicated there will be compliance with the 0.1 pg/l TEQ effluent limitation. However, laboratory detection levels are generally too high to detect dioxins at water quality objective levels, and limited monitoring has been conducted.

As stated above, Chevron's final limit for dioxins will be based upon a TMDL. A ten-year compliance schedule is established with an interim limit taken from the previous permit limit of 0.1 pg/l TCDD equivalents.³⁶ The previous permit limit was based on the now rescinded Enclosed Bays and Estuaries Plan (EBEP). It appears that the previous limit was derived by taking the EBEP criterion of 0.014 pg/l TEQ, then allowing a 10:1 dilution factor. The resulting

³² See, SWRCB Order WQ 2002-0012 (EB MUD), at p. 7.

³³ Chevron Richmond Refinery, Request for Compliance Schedule and Demonstration of Infeasibility to Achieve Immediate Compliance with Calculated Limit for Dioxin, May 23, 2001, at p. 4.

³⁴ *Id.*, at p. 6.

³⁵ This detection of OCDD was flagged as "less than the Lower Method Calibration Limit (LMCL) and should be considered as estimated value." Permit, Finding 42. Estimated concentrations may indicate a less reliable value.

³⁶ Permit, Finding 43.

limit of 0.14 pg/l TEQ was then truncated to 0.1 pg/l TEQ. Chevron has reported compliance with the 0.1 pg/l TEQ limit since it was imposed in the previous permit in 1992. The 0.1 pg/l TEQ limit is achievable because Chevron has reported compliance with the limit for many years.

Reasonable potential was established because San Pablo Bay is listed as impaired by dioxins on the 303(d) list due to fish tissue residues, because it is known that dioxins can form during catalyst reforming, and because of the potential toxic impact of the pollutant. This reasonable potential is established for TCDD equivalents under the Basin Plan narrative objective for bioaccumulation of toxic substances. The interim limit is based on the prior permit limit, for which Chevron has reported compliance for many years.³⁷ This indicates that the current limit is achievable with available control strategies. The 0.1 TCDD equivalents interim effluent limitation is appropriate in this case.

G. Limits for PAHs and PCBs

Contention: Communities for a Better Environment contends that the Regional Board failed to set numeric water quality based limits or set inappropriate limits for a number of constituents, including polynuclear aromatic hydrocarbon (PAH) compounds and polychlorinated biphenyls (PCBs). PAHs are natural constituents of crude oil, while PCBs are used in electrical applications and hydraulic fluids. Both vary in toxicity and may be carcinogenic.

Finding: The omission of an effluent limit for PAH benzo(b)fluoranthene should be corrected on remand. The limits applied for PCBs were set based on a misinterpretation of the CTR criteria. Effluent limits on PCB aroclors should be revised to a limit on total PCBs to reflect the correct interpretation, as set forth below.

Although PAH benzo(b)fluoranthene was found to have reasonable potential, no effluent limitation was imposed in the permit. The Regional Board states that this was due to a typographical error wherein a limit for benzo(k)fluoranthene appeared in place of

³⁷ Although Chevron refers to the interim limit as a performance-based limit, it is instead based on the prior permit. This approach is consistent with the Implementation Policy, which is appropriate for use as guidance for non-CTR pollutants. The Policy states that: “Numeric interim limitations for the pollutant must be based on current treatment facility performance or on existing permit limitations, whichever is more stringent.” Implementation Policy, § 2.2.1. Because there is difficulty in evaluating current performance, the prior permit limit is an appropriate interim limit.

benzo(b)fluoranthene and will be corrected using procedures provided in the federal regulations.³⁸ The correction should be made on remand.

The effluent limits for PCBs were set based on a misinterpretation of the CTR criteria. The human health criteria for PCBs is 0.00017 µg/l total PCBs. Total PCBs is defined as “the sum of all congener or isomer or homolog or aroclor analyses.”³⁹ The Regional Board set the average monthly effluent limit as 0.00017 µg/l for each of seven PCB aroclors. That number should represent the allowable discharge for all PCBs combined rather than for each individual compound. On remand, effluent limits for PCB aroclors should be revised to a limit on total PCBs.

III. CONCLUSIONS

Based on the above discussion, the Board concludes that:

1. Permit findings must reflect the basis for granting or denying dilution credit based on the factors set forth in the Implementation Policy.
2. Selection of monitoring stations for purposes of determining ambient background water column concentrations of priority pollutants must comply with the Implementation Policy.
3. The Regional Board failed to use an appropriate method to calculate the feasibility of compliance with final limits.
4. Interim mercury limits were calculated using valid statistical procedures that resulted in a representative analysis of current performance.
5. The Regional Board inappropriately relied on the “other information” provisions in the Implementation Policy in finding reasonable potential for pesticides previously manufactured at the Chevron Chemical Company facility.
6. The Regional Board inappropriately applied CTR definitions of saltwater and freshwater for Basin Plan priority pollutant objectives left in place by the CTR.
7. The Regional Board applied an appropriate interim limitation for dioxin and furan compounds based upon the previous permit limit.

³⁸ San Francisco Bay Regional Water Quality Control Board, Response to Petitions for Review of Waste Discharge Requirements Order No. 01-067, Response 30, at p. 23.

³⁹ 40 C.F.R. § 131.38(b)(1), fn. v.

8. The Regional Board inappropriately failed to include an effluent limit for PAH benzo(b)fluoranthene.

9. The Regional Board misinterpreted CTR criteria in applying effluent limits for PCBs.

IV. ORDER

IT IS HEREBY ORDERED THAT, for the reasons discussed above, Order No. 01-067 is remanded to the Regional Board for reconsideration and revision of those portions of the permit that address conclusion numbers 1, 2, 3, 5, 6, 8 and 9 consistent with this order.

CERTIFICATION

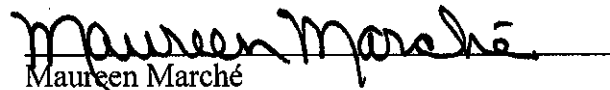
The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on July 18, 2002.

AYE: Arthur G. Baggett, Jr.
Peter S. Silva
Richard Katz
Gary M. Carlton

NO: None

ABSENT: None

ABSTAIN: None


Maureen Marché
Clerk to the Board