

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Request for An
Exception to the 1978 Water Quality
Control Plan for Ocean Waters of
California by the City and County of
San Francisco for the Richmond Sunset
Sewerage Zone Wet Weather Diversion
Structures.

Order No. WQ 79-16

BY THE BOARD:

The City and County of San Francisco (dischargers) have a combined storm and wastewater collection system. When rainfall exceeds 0.02 inches per hour, untreated domestic wastewater mixed with stormwater runoff is discharged into the Pacific Ocean through any of eight wet weather diversion structures in the Richmond Sunset Sewerage Zone. These facilities are located on the West or Ocean side of the peninsula.

On March 16, 1976, the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board) adopted Order No. 76-23, Waste Discharge Requirements for the wet weather diversion structures. Order No. 76-23 required the discharger to reduce the frequency of discharge from diversion structures from an average of 114 overflow events per year to an average of one overflow event per year and to undertake a study to better define the cost and water quality benefits of facilities designed to achieve various overflow frequencies. Upon completion and submittal of the study on

December 15, 1978, the discharger requested the Regional Board to consider an increase in the allowable frequency of the discharge for the wet weather diversion structures from an average of one overflow per year to an average of eight overflows per year.

Broadly speaking, the 1978 Water Quality Control Plan for Ocean Waters of California (Ocean Plan) prohibits the discharge or by-pass of wastewater to the ocean not conforming to the standards in the Ocean Plan. Exceptions to the standards contained in the Ocean Plan may be granted on a case by case basis. Untreated wet weather diversions require an exception to the Ocean Plan.^{1/}

On January 16, 1979, the Regional Board adopted Order No. 79-12, amending Order No. 76-23 to allow an average of eight overflows per year. Based on the evidence presented at public hearing, the Regional Board determined that an exception to the Ocean Plan is warranted. By letter dated February 5, 1979, the Regional Board requested the State Water Resources Control Board (State Board) to review and approve exceptions to the Ocean Plan as recommended by Regional Board Order No. 79-12.

On March 16, 1979, the State Board held a public hearing to receive evidence pertaining to the request for an exception to the Ocean Plan.

^{1/} See discussion under II. Ocean Plan, page 7.

I. EXISTING WASTE COLLECTION AND DISPOSAL SYSTEM
COMPARED TO THE PROPOSED SYSTEM.

San Francisco is the only city in California with a completely combined sanitary and stormwater system.^{2/} The City and County of San Francisco is comprised of three hydro-graphic sub-units and the plans for the collection and treatment of wastewater and stormwater runoff correspond to the sub-units. The Richmond Sunset Sewerage Zone corresponds to the most western sub-unit and may be defined, generally, as that portion of the County north of the San Francisco-San Mateo county line and draining the western slope of the coastal hills dividing the County. Currently, all sewered wastes are routed to the waste treatment plant situated in the western end of the Golden Gate Park. The plant provides primary treatment and chlorination to wastewater prior to ocean discharge. As indicated previously, when rainfall exceeds 0.02 inches per hour, untreated domestic wastewater mixed with stormwater runoff is by-passed from the sewer lines carrying wastewater and runoff to the treatment plant into the ocean through any of eight wet weather diversion structures. From south to north, the diversion structures are situated near Lake Merced, Vicente Street, Lincoln Way, Mile Rock and four are grouped on Bakers Beach.

^{2/} Water Quality Control Plan Report, San Francisco Bay Region, Chapter 16, page 73.

The outfalls range widely in size and discharge onto the Beach at or near the waters edge. For instance, the outfall at Lake Merced is about ten feet by eleven feet, the outfall at Vicente Street is two barrels about five feet in diameter and the smallest outfall, near Bakers Beach, is eighteen inches in diameter.

The discharger is proposing to construct storage, pumping, treatment and outfall facilities in the Richmond Sunset Zone to comply with waste discharge requirements including the requirement that (with the exception of an average of eight allowable overflows per year) the discharge of untreated waste is prohibited.^{3/}

"The concept which underlies all overflow alternatives in the Great Highway is an "intercepting system" whereby the sewer functions as a storage facility and as a transport conduit. By maximizing the continuous movement of sewage in a storage facility, excessive deposition of solids is prevented. The major storage facility (Westside Transport) is located under the Upper Great Highway between Fulton Street and the Westside Pump Station just south of Sloat Boulevard. The Richmond and Lake Merced area flows will be collected and directed to storage in the Westside Transport via tunnels.^{4/}

^{3/} As amended by Order 79-12, Regional Board Order No. 76-23, Discharge Prohibition A.1 provides in part:

Discharge of untreated waste to waters of the State is prohibited with the exception of allowable overflows as defined below. The City shall design and construct facilities for diversion structures No. 1-8 to achieve a long term average of 8 overflows per year from these facilities.

^{4/} Abstract Report Westside Wet Weather Facility Revised Overflow Control Study, December 1978, Section IV, page 4

"Storm flows would be by gravity to the Westside Transport for storage and transport to the Westside Pump Station, then pumped to the proposed Southwest Water Pollution Control Plant (SWWPCP) south of the Zoo for treatment. Effluent would be discharged into the ocean two miles offshore via a deep-water outfall. When storage and withdrawal rates are exceeded, by-passing would occur with some control through the Vicente and Lincoln Way Outfalls, Lake Merced and Bakers Beach (Richmond) Outfalls with possible selectivity into the Mile Rock Outfall... The existing Richmond Sunset Water Pollution Control Plant located in Golden Gate Park will be abandoned, thereby returning four acres of park land to recreational uses.

* * *

"The Mile Rock Outfall (shoreline discharge) now functions as both the effluent outfall for the Richmond Sunset plant and as a wet weather overflow discharge for flows originating in the westerly portion of the Richmond Sunset district. Upon relocation of the dry-weather treatment to the Southwest side, dry-weather discharges to Mile Rock would cease and wet weather discharges would be reduced to the specified frequency."^{5/}

The proposed Southwest Water Pollution Control Plant referred to in the foregoing quotations would be located immediately south of the grounds of the Fleishhacker Playground and Zoo and Sloat Boulevard. As envisioned, currently, a storage facility designed for a rate of eight overflows/year would consist of a channel seventeen and one-half wide and twelve to forty-five feet deep, running along the Great Highway between Fulton to Lincoln Way. The discharger does not propose to make any physical alterations to the existing wet weather outfalls.

^{5/} Section IV, page 5 of report cited previously. (Note 4).

The following table abstracted from Finding 4 of Regional Board Order No. 79-12 provides a comparison between the performance of the existing facilities and the performance anticipated in a system designed for an average of eight overflow incidents annually.

Average Number of Overflows Per Year	Existing 114	Proposed 8
Minimum/maximum number of overflows per year	26/193	1/18
Percent of annual combined wastewater treated (avg.)	74.1	95.9
Percent of annual combined wastewater which overflows (avg.)	25.9	4.1
Volume of overflow (Million gallons/year, avg.)	2870	449
Total hours of overflow per year (avg.)	372	32
Minimum/maximum hours of overflow per year	163/617	2/78
Average duration of overflow (hours)	3.3	4
Composition of overflows (avg.)		
Percent sewage	12	6.5
Percent storm water	88	93.5
Percent reduction in BOD ₅ and Suspended Solids discharged from existing overflows (avg.)	base	84
Average number of days nearshore water adjacent to discharge points exceed coliform standards for body contact recreation		
days greater than 1000 MPN/100 ml	119	25
days greater than 10,000 MPN/100 ml	70	10

II. THE OCEAN PLAN

The Ocean Plan was adopted to protect a wide range of beneficial uses^{6/}, Order No. 76-23 indicates that to some degree the following beneficial uses are made of the ocean waters in the vicinity of the diversion structures:

(1) Water Contact Recreation; (2) Non-contact Water Recreation; (3) Marine Habitat; (4) Commercial and Sport Fishing; (5) Fish Migration; and (6) Wildlife Habitat.^{7/}

To protect beneficial uses, the Ocean Plan provides for the concurrent application of certain regulatory mechanisms (standards) to discharges into ocean waters. These mechanisms can be broadly identified as including:

- 1) Water Quality Objectives (Chapter II).
- 2) General Management Requirements (Chapter III).
- 3) Effluent Quality Requirements (Chapter IV).
- 4) Discharge Prohibitions (Chapter V).

^{6/} Chapter I, Ocean Plan.

^{7/} For definitions of these uses, see Chapter 4, pages 1-5, Water Quality Control Plan Report, San Francisco Bay Region.

Exception to the standards contained in Chapters II through V, is provided for in Section G, Chapter VI., which provides:

"The State Board may, subsequent to a public hearing, and with the concurrence of the Environmental Protection Agency, grant exceptions to any provision of this Plan where the Board determines:

- 1) The existence of unusual circumstances not anticipated at the time of the Plan's adoption;
- 2) The exception will not compromise protection of ocean waters for beneficial uses; and
- 3) The public interest will be served.

To some degree, authorization of the continued use of the wet weather diversion structures will require an exception to each of these regulatory mechanisms.

A. CIRCUMSTANCES NOT ANTICIPATED

Examination of the record in this matter clearly indicates "[t]he existence of unusual circumstances not anticipated at the time of the Plan's adoption." One such circumstance arises out of the Ocean Plan's failure to address, directly, how it would regulate the by-passing of combined waste flows.

Referring to the record pertaining to the State Board's adoption of the 1978 amendments to the Ocean Plan, it is patently clear that it was realized it was inappropriate to apply Ocean Plan standards strictly to combined waste and stormwater discharges. The record indicates, further, that rather than address this problem in the 1978 Ocean Plan amendments, directly, it was decided to deal with such problems on a case-by-case basis via the exception mechanism. Plainly it was not considered possible to anticipate in what manner the Ocean Plan should be modified to deal with the circumstances that would be presented by particular combined wet weather discharges. Additionally, it was realized that the discharges in question here would, in all probability be the subject of an exception proceeding under the Ocean Plan.^{8/}

Finally, it should be recognized that, with the exception of the planned eight overflow events, the City will be providing waste treatment to all stormwater runoff contained in the proposed system (about 86 percent). This contrasts, markedly, with the vast majority of communities that collect and discharge stormwater runoff without any treatment because runoff is not comingled with domestic waste flows. We conclude, therefore, that present in this request for an exception are unusual circumstances not anticipated at the time of the Ocean Plan's adoption.

^{8/} Position Paper 7, Proposed Amendment of Ocean Plan, December 29, 1977

B. PROTECTION OF WATERS FOR BENEFICIAL USES

No exception to the Ocean Plan may be granted if protection of ocean waters for beneficial uses will be compromised. Considering the testimony presented at the March 16, 1979, hearing and reviewing the Regional Board's record on this matter, it appears that those beneficial uses of concern are: contact and non-contact water recreation; marine habitat and sport fishing. The proposed wet weather diversions have three characteristics which may adversely affect these beneficial uses, that is, toxicity, coliform and floatables.

A wet weather diversion may contain toxic components which pose a threat to marine habitat and sport fishing. Table B of the Ocean Plan provides specific limitations for certain toxic materials.^{9/} Relying upon the discharger's Abstract Report Westside Wet Weather Facility Revised Overflow Control Study, December 1978 (Abstract Report) the Department of Fish and Game^{10/} testified that the discharger's investigation indicated that lead, copper and zinc would be present in the wastewaters by-passed in excess of permissible Table B concentrations.^{11/}

^{9/} Chapter IV, Ocean Plan.

^{10/} Testimony by Mike Martin, Ph.D.

^{11/} Table V-3.

Although stormwater is initially high in concentrations of toxic materials, the concentrations are rapidly diluted by additional stormwater runoff. Averaging four hours in duration, the discharges are intermittent. Bioassays involving placement of three spine stickleback in undiluted combined effluent for 96 hours resulted in one hundred percent survival of the fish more than fifty percent of the time. Although this fish is more pollutant tolerant, no organisms in the marine environment would ever be exposed to undiluted overflow for more than a few hours.^{12/} It should be noted, additionally, that the Department indicated it had no specific information showing that marine habitat had been impaired from the many years of by-passing of these metals at high frequencies and concentrations. It is anticipated that the proposed system will provide waste treatment to about eighty-six percent of stormwater runoff. In the long run, therefore, the amount of toxic substances entering the ocean from the proposed system will be substantially less than from other communities that do not have a combined system. Under these circumstances, we do not conclude that the marine habitat and sport fishing beneficial uses will be compromised because of toxic concentrations of lead, copper and zinc. However, special provisions to reduce the concentration of toxic materials will be made a condition of the exception granted by this Order.

^{12/} Section V, page 4, Abstract Report.

Coliform are a group of bacteria predominantly inhabiting the intestines of man or animals. Coliform organisms are used as indicators of the possible presence of disease organisms. Of concern, to health officials are the diseases of Shigellosis, Salmonellosis and Hepatitis A. Provision A "Bacteriological Characteristics", Chapter II, of the Ocean Plan contains coliform standards intended to prevent the transmission of disease.

Wet weather discharges may contain coliform in concentrations that would make contact and non-contact recreation uses unsafe. Disease organisms may also contaminate shellfish, making harvesting unsafe for short periods of time. Coliform will be present in the wet weather discharges for which exception is sought due to the comingling of untreated domestic wastewater and stormwater runoff in the combined sewer system. Untreated wastewater will make up about 6.5 percent of the total volume of overflows if San Francisco implements the eight by-pass proposal.

Under current wet weather discharge conditions, the beach areas are posted as being unsafe for contact recreation from about October to April of each year due to high coliform concentrations. Twenty-five years of epidemiological data, however, shows no clinically confirmed cases of enteric disease from either recreational contact with ocean waters or the consumption of shellfish harvested from those waters.^{13/} It is estimated that the proposed facilities will result in coliform concentrations requiring posting of the beaches for an average of about twenty-five days per year.^{14/} In addition, based on

^{13/} Section V, page 13, Abstract Report.

^{14/} Plate 7, Reference Plates, Abstract Report.

data contained in the Abstract Report it is reasonable to conclude that recreational uses of the beach areas and waters will be minimal and that shell fishing will be unlikely to occur during and immediately following the winter storms that will result in an overflow.^{15/} Given these circumstances, we do not believe that the elevated coliform concentrations for the time in question constitute a compromise of contact and non-contact recreational uses.

Floatables include fecal matter and other organic and inorganic substances. Such materials may shelter coliform and prolong coliform concentrations in the receiving water. Also, for aesthetic reasons, floatables may interfere with contact and non-contact recreation uses. Chapter III, B, requires that "[w]aste discharged to the ocean must be essentially free of: 1. material that is floatable...".

Current wet weather discharges contain substantial quantities of floatables. By installing a baffling system, it is anticipated that the proposed facilities will reduce the discharge of floatables as much as seventy to ninety-five percent from existing levels.^{16/} In addition, the storage capacity being built into the proposed facility will result in substantial reduction of the amount of settleable solids discharged. As noted under our previous discussion regarding coliform, epidemiological data does not indicate the existence of adverse public health problems associated with the current wet weather discharges. Considering the foregoing discussion, we do not conclude that the beneficial uses under consideration will be compromised by the proposed discharges.

^{15/} Plate 6, Reference Plates, Abstract Report.

^{16/} Section VII, page 2, Abstract Report.

C. PUBLIC INTEREST CONSIDERATIONS

Exemptions to the Ocean Plan cannot be granted unless the public interest will be served by granting such exemptions. Analysis of whether the public interest will be served in this matter necessarily involves protection of beneficial uses of ocean waters, the uniqueness of the discharger's sewer system, and economic impacts in terms of capital costs, operation and maintenance costs and user charges.

The discharger's sewer system is a combined system which collects and routes to the treatment plants both sanitary sewage and stormwater. Whenever rainfall exceeds 0.02 inches per hour, this combined wastewater by-passes the treatment plants and discharges to waters of the United States. This occurs on the average of 114 times per year from various overflow structures located throughout the treatment area. This totally combined system is unique and the only major system of its kind in the state of California. Consequently, when the discharger completes the projects and facilities discussed previously in this Order, presuming eight overflows, they will not only be treating ninety-nine percent of sanitary wastewater but will also be treating eighty-six percent of stormwater runoff. This combined treatment will substantially reduce pollutant loadings to the ocean from urban runoff, an accomplishment unique to the discharger's system. Unquestionably this serves the public interest.

We have previously discussed protection of beneficial uses. This is an integral part of serving the public interest. Further, the Central Coast Regional Coastal Commission (Regional Commission) has denied the discharger a required development

permit based on one overflow in part based on the size and location of the transport necessary for a one overflow system. The Regional Commission's concerns related to future beach erosion, sewer exposure and seismic and groundwater problems. An allowance of eight overflows will allow a smaller transport system to be built. The State Commission has now assumed jurisdiction in this matter.

The cost impacts and savings of allowing eight overflows on the westside are enormous. Considerable evidence was introduced in the Regional Board record and at the hearing regarding these costs and savings. Capital costs of the Westside project assuming one overflow are \$299,000,000 and \$189,000,000 assuming eight overflows. Thus, an increase in the number of overflows from one to eight would result in a \$110,000,000 capital cost saving. The annual operation and maintenance cost savings would be \$10,000,000. Table IV-1 of the Abstract Report shows detailed cost comparisons for the various parts of the Westside project. Plate 5 of the Abstract Report tabulates the cost of suspended solid, BOD, and coliform benefits for different overflow levels. The testimony presented indicates substantially diminishing benefit returns per dollar spent as the number of overflows diminishes below eight. This is clearly demonstrated by the Regional Board graph dated January 15, 1979.

Considerable written and oral testimony was presented to the State Board and the Regional Board regarding citizen concern for user charges. This testimony included comments from The West of Twin Peaks Central Council, The Citizens Advisory Committee for Wastewater Management, The Hotel Employers Association, The Sunset Coalition, The Sunset-Parkside Education and Action Committee, Paul D. Berrigan, Brig. Gen. Retd., Descon Corporation, The San Francisco Bay Chapter Sierra Club, and The Parkside District Improvement Club, Inc.. The user charge based on eight overflows is more reasonable than for one or zero.

Based upon the factors above, we find the public interest will be served by granting the discharger an exemption to the Ocean Plan to allow an average of eight overflows per year.

III. EXCEPTION SUBJECT TO CONDITIONS

Subject to the following conditions, this Order excepts the proposed by-passes from the terms of the Ocean Plan.

1. The discharger shall perform a self-monitoring program in accordance with the specifications prescribed by the Regional Board as indicated in Provision 12 of Regional Board Order No. 79-12. All beaches affected by the wet weather overflows shall be posted with warning signs for the period of time beginning when the overflow commences and continuing until analysis indicates the water quality of the affected areas is meeting bacteriological standards for recreation.

At all areas where shellfish may be harvested for human consumption warning signs shall be posted for the period of time beginning when the overflow commences and continuing until the City and County Health Department indicates that no further posting is required.

2. Excepting provision Chapter II. A., to the greatest extent practical, the discharger shall design, construct and operate facilities which will conform to the remaining standards set forth in Chapter II of the Ocean Plan.
3. To the greatest extent practical, the discharger shall design, construct and operate facilities that will comply with the conditions controlled by the requirements provided by Chapter III, Sections A and B of the Ocean Plan.

4. The discharger shall develop the conceptual proposals for the design to be used and the technologies to be installed in the facilities intended to assure compliance with conditions 2 and 3. The proposals shall be submitted to the State Board and the EPA for approval within sixty days following adoption of this Order.
5. Excepting an average of eight overflows per year, the discharger shall design and construct facilities that will contain all other stormwater runoff.^{17/} The discharge of all other untreated waste to waters of the state is prohibited.
6. The State Board Division of Water Quality shall critically review the discharger's grant application and subsequent design and construction and the Regional Board shall review operating performance to assure compliance with conditions 1, 2, 3 and 5.
7. The discharger shall fully comply with any federal and state source control program in order to minimize the entry of toxic substances into the waste collection system from in-

^{17/} For the purpose of this Order, allowable overflows are those overflows permitted by Discharge Prohibitions A.1., Order No. 76-23 as amended by Order No. 79-12. In addition, any two overflows within one storm or a series of storms, separated by six or more hours shall be considered two separate overflow events. This requirement for an average of eight overflows is based upon the 62 year period of rainfall record used by the City in developing its facility design.

dustrial dischargers. To the extent that Section 208 studies being conducted by ABAG conclude there are feasible measures for reducing the entry of toxic substances into the collection system from stormwater runoff, the discharger shall implement such measures in accordance with a plan approved by the Regional Board.

8. Notwithstanding this Order, if the Regional Board finds that changes in location, intensity or importance of affected beneficial uses or demonstrated unacceptable adverse impacts as a result of operation of the constructed facilities have occurred, it may require the construction of additional facilities or modification of the operation of existing facilities.

As noted earlier, the exception granted by this Order is subject to the concurrence of the EPA. The EPA may attach, independently, other conditions upon the discharger as a condition of granting an exception.

IV. ADDITIONAL CONSIDERATIONS

The discharger completed a final EIR/EIS for the Wastewater Master Plan in May 1974. The discharger completed a final EIR for the Westside Transport facility in July 1977, which addressed overflows from diversion structures Nos. 2 and 3. This EIR identified potential adverse water quality impacts from this project related to seismic activity and the project has been modified to mitigate this potential impact. This EIR will be amended by the discharger following adoption of this Order. The discharger has commenced preparation of a draft EIR for the Richmond Tunnel facility which will address overflows from diversion structures Nos. 4 through 8, and has indicated they will prepare

an EIR for the Lake Merced Transport facility which will address overflows from diversion structure No. 1. Upon completion of the amendment to the Westside Transport facility EIR, the final EIR for the Richmond Tunnel facility, and the final EIR for the Lake Merced Transport facility, the State Board will review any adverse impacts identified, and if necessary, make appropriate revisions of this Order.

V. CONCLUSIONS

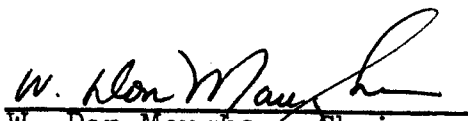
After review of the record and for the reasons heretofore expressed, we have reached the following conclusions:

1. Subject to the conditions set forth in "III. EXCEPTION SUBJECT TO CONDITIONS," the proposed wet weather discharges by the City and County of San Francisco from the eight diversion structures in the Richmond Sunset Sewerage Zone are excepted from the requirements of the Ocean Plan.
2. Revisions may be made to this Order upon completion of the amendment to the Westside Transport facility EIR, the final EIR for the Richmond Tunnel and the final EIR for the Lake Merced Transport facility.


VI. ORDER

IT IS HEREBY ORDERED that the discharger's request for an exemption is granted subject to the conditions contained in "III. EXCEPTION SUBJECT TO CONDITIONS". Revisions may be made to this Order upon completion of additional environmental documents.

Dated: March 23, 1979



W. Don Maughan, Chairman



William J. Miller, Member



L. L. Mitchell, Member

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