

DOCUMENT NO. 499197
FILED OCT 8 - 1954
OFFICE OF THE CITY CLERK
SAN DIEGO, CALIFORNIA

REPORT ON SAN DIEGO BAY AREA SEWERAGE PROBLEM

STAFF REPORT

to the

SAN DIEGO REGIONAL WATER POLLUTION CONTROL BOARD

September 1954

SAN DIEGO, CALIFORNIA

OCT 8 2 45 PM 1954

RECEIVED
CITY CLERK'S OFFICE

M E M O R A N D U M O F T R A N S M I T T A L

29 September 1954

TO: The Members
 San Diego Regional Water Pollution Control Board

FROM: Harold E. Miller
 Executive Officer

SUBJECT: Staff Report on San Diego Bay area sewerage problem

Submitted herewith, in accordance with directions issued by the Board at its meeting of June 29, 1954, is a staff report on the San Diego Bay area sewerage problem. The report consists of the following main elements:

- I. General considerations involved in the control of water pollution.
- II. Beneficial uses of San Diego Bay waters.
- III. Evaluation of existing Bay water quality.
- IV. Bay water quality as related to existing uses.
- V. Area-wide aspects of pollution control.
- VI. Summary of waste discharges entering San Diego Bay.
- VII. Review of responsibilities and duties of the Board.
- VIII. Recommendations.

Within the limitations of presently available information, the Board's 1952 report on the same subject is brought up to date.

Unfortunately, no net gain in terms of reduced Bay pollution, in fact, only a further degradation can be reported. This however, does

not mean that no progress has been made. The basic data prerequisite to sound planning and solutions have been accumulated, and public awareness of the existing situation and of the need for expediting remedial measures has in large measure been achieved. Concrete plans have been prepared and, although no plan has as yet been approved by the voters, planning continues. Considering that we are dealing with a most complicated sanitary engineering problem involving many overlapping interests and responsibilities, we believe that this constitutes significant progress. On the other hand, with increasing volumes of sewage being discharged, conditions in San Diego Bay have, since the time of our previous report, gone from bad to worse and the consequences of failure to act very soon could be extremely serious.

For these reasons, the staff has recommended that the Board now adopt a specific step-by-step course of action designed to accomplish the mission which it is assigned by the statutes - to stop pollution. In making this recommendation we are not unmindful of the excellent cooperation this Board and its staff have received from City and County officials, from the many civic organizations and citizens who have worked side by side with us, and from the press which has laid the facts before the people. Insofar as the writer is concerned, he can state in all sincerity that he has never enjoyed finer cooperation anywhere in over 17 years of public service. Further, in recommending specific action, we do not infer that our efforts to cooperate and assist in such ways as we can should be slackened - instead they should be redoubled.

We have tried to make this report as factual as possible. It is based on five years of investigation and first-hand observation. However,

a problem of this magnitude and complexity involves many intangibles, and these we have not hesitated to discuss.

One conclusion is inevitable - the most valuable natural resource of this area is being impaired at an alarming rate. Recognizing that years of construction lie ahead, that the consequences of failure to control pollution will respect no political boundaries, and that, like it or not, this area is bound to become one of the large metropolitan areas of this country we cannot too strongly emphasize the importance of sound, realistic planning and the urgency of undertaking remedial measures.

Respectfully submitted,



Harold E. Miller
Executive Officer

HEM:gst

I. GENERAL CONSIDERATIONS INVOLVED IN THE CONTROL OF WATER POLLUTION

Section 13005 of the California Water Pollution Control Act (Division 7 of the Water Code) defines pollution as an impairment of waters of the State by sewage and industrial waste to a degree which adversely and unreasonably affects such waters for domestic, industrial, agricultural, navigational, recreational, or other beneficial use. The criteria upon which the control of pollution are based are, therefore:

(1) What beneficial water uses must be protected?

(2) What conditions can the waste disposer be reasonably required to meet in order to protect those uses?

II. BENEFICIAL USES OF SAN DIEGO BAY WATERS

In its 1952 report, the Board listed and evaluated the beneficial uses of Bay waters and set forth certain long-range objectives designed to achieve water quality adequate for: Navigation, industrial water supply, recreation, fish and wildlife, and esthetic enjoyment. A discussion of these uses and their relative importance, together with a number of supporting documents, are contained on pages 9 through 18 of the report.

No significant changes involving any of the foregoing uses have taken place since the date of the report. It is believed, however, that an additional use, that of transportation of persons, food, and potable water, should be added because of its relative importance from the standpoint of numbers of persons affected and because water quality considerations peculiar to this use are involved.

Since there may be other uses requiring special consideration and since safeguarding beneficial use constitutes the basis of all waste

disposal requirements, it is suggested that the Board consider holding a public hearing, prior to the development and adoption of any waste disposal requirements affecting San Diego Bay, in order that all interests will have the opportunity to be heard. To assist the staff in the development of tentative requirements to be recommended to the Board for adoption, permission is requested to enlist the aid of beneficial use advisory committees consisting of officials and citizens representative of the several beneficial use interests. The use of such committees would also insure adequate coordination of all interests.

III. EVALUATION OF EXISTING BAY WATER QUALITY

A. Review of Conditions Reported in 1952

A discussion of conditions found during the 1950-51 investigation is contained on pages 19 through 22 of the Board's 1952 report. As indicated on Plates 2 and 3 and Figure 6, Appendix II thereof, (pages 20, 22, and 77 respectively) the conditions then found can be summarized as follows:

1. Coliform densities in excess of 10 per ml were found throughout Central San Diego Bay from a line extending roughly from the Coast Guard Station to North Island to a line extending roughly from the Navy Amphibious Base to a point well south of the mouth of the Sweetwater River; throughout most of this area coliform densities equalled or exceeded 70 per ml. In the remainder of the Bay, densities in excess of applicable use standards were found with sufficient frequency to merit concern in 1952. Although the data from surveys conducted prior to 1950 were sketchy, it was clearly indicated that the zones of high coliform density, formerly found only in the vicinity

of outfall sewers, had gradually increased in size and that by 1951 these zones had merged, resulting in the condition described above.

2. Dissolved oxygen concentrations throughout most of Central and South San Diego Bay were approaching 4.0 ppm. In the North Bay, concentrations as low as 5.0 to 6.0 ppm were frequently found, while the outer harbor beyond Shelter Island appeared to be little affected. Except in the outer harbor, phytoplankton blooms were found to be the main source of oxygen replenishment, the lower concentrations of dissolved oxygen being found during "off bloom" periods. Except for excessive turbidity caused by algal blooms, it was believed that, within reasonable limits, such blooms would exert little detrimental effect. As will be discussed later, however, this assumption was probably erroneous.

3. Sludge deposits resulting from waste disposal were found along the northeasterly portion of the Bay in a band some 9,000 yards long and 200 yards wide amounting to an area of 1,800,000 square yards. These deposits contained hydrogen sulphide and were completely devoid of marine bottom life, an important source of food for fish.

4. Although the physical appearance of Bay waters was, generally speaking, good, solids of sewage origin were frequently observed in the vicinity of crude sewage discharges from the City of Coronado outfalls and along the northeasterly shore of the Bay where numerous minor crude sewage discharges from harbor front establishments were found. Widespread oil slicks and accumulations of floating debris, especially along the Silver Strand, were also observed frequently. The color of Bay water was found to vary from brown to green depending on biologic (phytoplankton) activity,

but no attempt to evaluate the importance of color and turbidity factors was made.

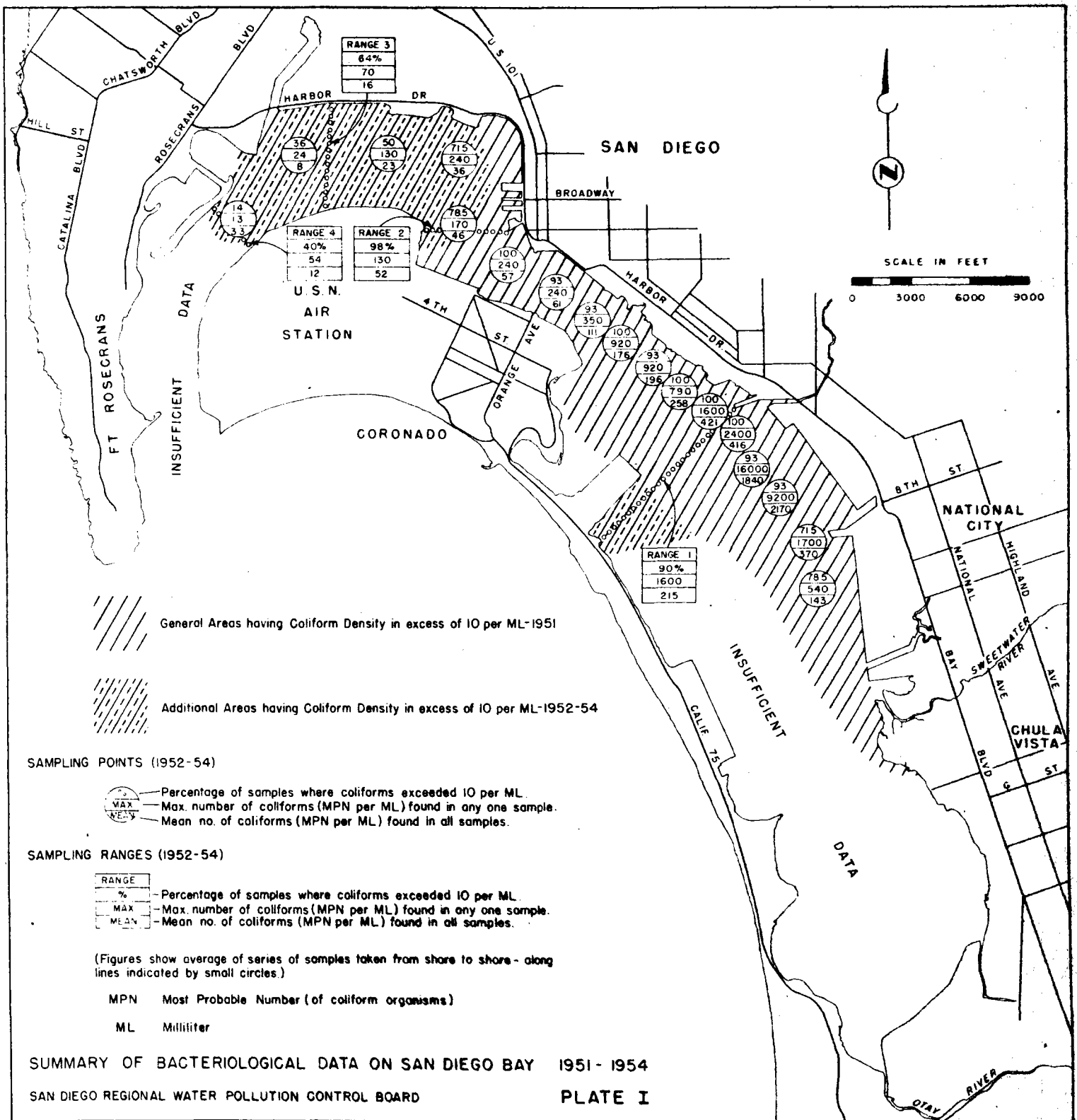
B. Present Condition of Bay Waters

Continuing investigations of Bay conditions have been conducted since the 1952 report was published. These have dealt mainly with bacteriological and biological considerations, but some additional data and information have been obtained with respect to dissolved oxygen, sludge deposits, and appearance. As will be outlined later, considerable additional data will be needed to aid in the development of waste disposal requirements. Information and data now at hand can be summarized as follows:

1. In cooperation with the U. S. Navy a further study of bacteriological factors was conducted during 1952, 53, and 54. In the main, these studies involved a two-year series of sampling at 17 stations located longitudinally along the main channel of the Bay from National City to Shelter Island and a series of cross sectional samples collected along ranges extending transversally from shore to shore at four critical sections of the Bay. The locations of the sampling points and ranges, together with a summary of the data obtained, is shown on Plate 1 hereof. The data indicate that:

a. Coliform densities in excess of 10 per ml were found in from 71.5% to 100% of the samples taken from Central San Diego Bay; in most of this area densities in excess of 10 per ml were found in from 93% to 100% of the samples.

b. The mean coliform density in the Central Bay area varied from 57 per ml opposite the G Street Pier to 2170 per ml in the vicinity of



the San Diego Sewage Treatment Plant and the maximum densities found in any one sample varied from 240 per ml opposite the G Street Pier to 16,000 per ml opposite the San Diego-National City Boundary.

c. Ninety percent of the samples taken along the range running from the 28th Street Mole to the Silver Strand had coliform densities in excess of 10 per ml, the average of all samples being 215 per ml and the maximum 1600 per ml.

d. In North San Diego Bay, from the Coast Guard Station west to about the northeasterly tip of Shelter Island, coliform densities in excess of 10 per ml were found in from 36% to 71.5% of the samples taken.

e. The mean coliform density in that area varied from 8 per ml at the west to 36 per ml at the east end of North San Diego Bay, and the maximum density found in any one sample varied from 24 per ml in the westerly portion to 240 per ml in the easterly portion.

f. Sixty-four percent of the samples taken along the range running north from about the mid-point of the north shore of North Island to Harbor Drive had coliform densities in excess of 10 per ml, the average of all samples being 16 per ml and the maximum 70 per ml.

g. In the vicinity of Shelter Island, 14% of the samples taken had coliform densities in excess of 10 per ml, the mean of all samples being 3.3 per ml and the maximum 13 per ml.

h. Forty percent of the samples taken along the range running from North Island to Shelter Island had coliform densities in excess of 10 per ml with a mean of 12 per ml and a maximum of 51 per ml.

Although periodic sampling, conducted by the State Department of Public Health, from shore stations adjacent to bathing areas indicates that coliform densities in excess of 10 per ml were not found with sufficient frequency as to violate salt water bathing standards close to the shoreline, sufficiently high counts to be of concern were common even at those stations and, as indicated on Plate 1, the recent surveys show that the area in which coliform densities generally exceed those standards has spread throughout North San Diego Bay and that the outer harbor waters in the vicinity of Shelter Island are, at best, on the borderline.

No additional sampling was conducted in the South Bay area, but it is probably safe to assume that conditions there would follow the same trend as in the North Bay, in view of the fact that this area is much nearer to the major sources of contamination and receives little effect of tidal flushing.

2. Only a limited amount of additional data on dissolved oxygen conditions have been obtained since 1952.

The San Diego Gas and Electric Company has conducted monthly dissolved oxygen tests of Bay water taken from its cooling water intake lines at the Silvergate and Broadway plants. Yearly averages of dissolved oxygen for 1952, 53, and 54 at the Silvergate plant were respectively 5.57, 4.67, and 4.21 and at the Broadway plant 4.52, 5.01 and 4.93.

A series of samples taken at three sampling points along a line running from the foot of Sampson Street to the Silver Strand show that concentrations below 4.0 ppm frequently occur throughout the sampling area and that the averages over a period of $1\frac{1}{2}$ years varied from 4.9 to 5.3 ppm.

Since it is known that during periods of phytoplankton blooms, concentrations equaling and often exceeding saturation points (8 to 12 ppm) occur, average concentrations fail to adequately reflect the more serious conditions occurring during the critical "off bloom" period which, in the final analysis, must be considered as the limiting factor.

Concentrations found in samples taken in the dock area of the Naval Repair Base show that the dissolved oxygen throughout that area frequently falls to from 2 to 3 parts per million.

Additional dissolved oxygen data, especially during the critical "off bloom" stages, are needed, but from the data at hand it appears that further deterioration of water quality has taken place since 1952 and that during much of the time the water fails to meet the criteria set forth in the Board's long-range objectives.

3. A number of bottom mud samples were collected in connection with the bacteriological studies and were superficially examined for evidence of sewage sludge. The examinations indicated that the area of detrimental sludge deposits is now larger than reported in 1952, but additional data are needed before the existing limits can be defined and definite conclusions drawn.

4. The general appearance of the Bay has undergone changes for the worse in several respects. There appears to be less care in the control of oily discharges as evidenced by more frequent and more extensive oily sleek conditions. This, however, is a situation which must largely be controlled separately, since only a small proportion of the contributory oils and greases are believed to originate with sewage and industrial waste

discharges. The problems of color and turbidity, which result from waste-induced biologic activity appear to be becoming worse. Discussions with persons who have observed Bay conditions over a period of many years indicate that until some 15 years ago phytoplankton blooms were not observable, but that in the intervening period they have gradually become greater in scope and intensity. It is significant to note that similar blooms are not observable in Mission Bay. During the past three years, especially during the summer months, blooms have on many occasions been so intense as to impart a deep brownish-red color to the water and at such times the turbidity reaches proportions where the transparency of the water is reduced to only a small fraction of normal - practically nil. Perhaps the most vivid description which can be given of the appearance of the water at such times is that it resembles brown pea soup. Inability of sunlight to penetrate to appreciable depths, coupled with the heavy oxygen demand loading of the phytoplankton itself during die off and off bloom periods, probably accounts for minimum dissolved oxygen conditions.

In this connection it is of interest to observe that many communities utilize artificial oxidation ponds with controlled loadings as a means of secondary sewage treatment. In such cases, appearance is not a factor nor are other beneficial uses involved. To the extent that Central San Diego Bay may be considered a confined body of water, which is considerable, and to the degree to which the natural capacity of that portion of the bay to absorb wastes without harmful effects has been exceeded, which is also considerable, the Central Bay can be considered nothing more nor less than a secondary sewage treatment plant. The tragic consequences which

are bound to result if the situation is permitted to persist in the face of sewage volumes double, triple, and perhaps quadruple, those presently discharged are difficult to even imagine.

IV. BAY WATER QUALITY AS RELATED TO EXISTING USES

Referring to the previously cited definition of pollution and the criteria for control, we now turn to consideration of the effects of the impairment of Bay water quality on uses.

A discussion of this subject as it appeared in 1951 is contained on pages 23 and 24 of the 1952 report. In general, it was concluded that all Bay water uses were affected to some degree and that except for navigation and esthetic enjoyment the degree of effect was serious. As will be pointed out later, the volume of offending wastes has since increased and it is therefore not surprising to find that the detrimental effects on water uses have also increased. While additional data are needed before regulatory requirements can be fully developed, a comparison of water quality necessary for unimpaired use and the conditions which are presently known to exist can be made at this time.

A. Water Quality As Related To Navigation

Water used for navigation should be free of substances which cause abnormal corrosion and other maintenance problems and, in a situation such as exists in San Diego Bay, the bacterial density should be held to a level as not to constitute a public health hazard due either to cross connections on board ship or to exposure of personnel by other means.

The waters of San Diego Bay fail to meet either of these criteria. Abnormal damage due to corrosion is estimated by the Navy to

amount to approximately \$1,500,000 per year for the Pacific Reserve Fleet moored in San Diego Bay alone. An unclassified report of the Department of the Navy (NRL Memorandum Report 255, 1 March 1954) states that damage due to corrosion in San Diego Bay is double that considered normal for ocean water. Recent studies indicate that the excessive corrosion being experienced here is due to electrolysis caused by the presence of abnormal amounts of organic substances resulting from waste disposal. Two factors are of importance in this regard: (1) The suspended and dissolved organic materials present in the waste discharges themselves, and (2) The excessive biologic activity such as the phytoplankton which thrive in San Diego Bay on the nutrient materials, phosphates and nitrogen, contained in the sewage. It is important to note in this regard that the degree of treatment afforded wastes would have little if any effect on phytoplankton production since the nutrient material is not significantly reduced by treatment processes. Experiments aimed at reducing corrosion of this type by means of cathodic protection are presently being conducted and, if successful, a further evaluation of this factor will be necessary.

The problem of permissible bacterial densities with respect to navigation is one which will require careful consideration since it is known that high bacterial densities exist throughout the area of navigational use. More than likely, however, limitations necessary in connection with other uses will bring the bacterial density within safe limits as regards navigational use.

B. Water Quality as Related to Industrial Water Supply

An adequate supply of water of suitable quality is needed not only for existing industries but for new industries which may be attracted to the area as well. Recent emphasis on port development and heavy expenditures by the San Diego Harbor Department on tidelands development for industrial sites underscore the importance of this factor. Most industrial uses require water of reasonable cleanliness, with a minimum of suspended material and slime-producing organisms and some require water of low bacterial density. The standards of the State Department of Public Health for whole fish handling operations, for example, are set forth on page 63, Appendix I of the 1952 report. In general, they limit the bacterial density, where waters are subject to sewage contamination, to not more than 7 coliform organisms per ml in over 20% of the samples taken. In the cannery area along East San Diego Bay, densities as high as 920 coliforms per ml, or approximately 130 times the standard, were observed in recent studies. Densities in excess of 7 per ml were observed in 100% of the samples taken at sampling points near the canneries. Perhaps as important as the food contamination factor is the exposure of industrial employees and others whose jobs bring them in direct contact with the sewage-laden Bay waters.

Under present conditions, Central San Diego Bay no longer offers a wholesome supply of industrial water adequate in quality for all the existing uses and inviting to potential industrial users.

C. Water Quality as Related to Aquatic Recreation

Much of North San Diego Bay, the outer harbor, and the Silver Strand area are extensively utilized for aquatic recreation. There is much

interest in, and apparently a need for, further development of recreational facilities. The need for maintaining certain standards of water quality for safe recreation is recognized throughout the civilized world. Since such standards allow for a reasonable factor of safety, use impairment sets in well before an actual hazard to the public health occurs.

Salt water bathing standards adopted by the California State Board of Health are set forth on page 23 of the 1952 report. The bacterial portion of the standards are that the coliform density, where waters are subject to sewage contamination, shall not exceed 10 organisms per ml in excess of 20% of the samples taken. A glance at Plate 1 will show that in most of the Bay coliform densities are far in excess of this number. It is not at all surprising that in view of this data the Director of Public Health of San Diego County recently found it necessary to warn the general public against bathing in Central and North San Diego Bay and to state that bathing anywhere in the Bay could not be recommended. As the medical official legally responsible for keeping the citizens informed on matters relating to public health, it seems he had no other choice. As a precautionary note, it was as a result of this standard being consistently exceeded that hundreds of thousands of citizens were deprived of the use of beaches throughout Santa Monica Bay for a period of five years until the new sewage treatment plant of the City of Los Angeles was constructed.

The steady encroachment of areas subject to high bacterial densities on recreational areas of the Bay constitutes an alarming impairment of water quality.

D. Water Quality as Related to Fish and Wildlife

The importance of fish and wildlife considerations in San Diego Bay is dramatically brought out in two letters reproduced in their entirety on pages 14 and 15 of the 1952 report. Further investigation has emphasized the important role which San Diego Bay plays in the total fisheries resources not only of this area but perhaps of a large part of the Southern California coastline as well. The reduction in dissolved oxygen concentrations in large sections of the Bay, the deposition of sewage solids not removed by existing treatment processes and possibly periodic high concentrations of toxic substances have already greatly reduced the value of the central and south portions of the Bay as a fish feeding and refuge area and a migratory bird habitat. Clamming is prohibited in parts of the Bay by Health Department orders and ducks in considerable numbers have been killed.

In an area where sport and commercial fishing is of primary significance and where nearby opportunities for hunting are limited, this would appear to constitute an unreasonable impairment of water quality.

E. Water Quality as Related to Transportation of Food, Water & Persons

San Diego Bay, particularly the central portion, serves as the highway on which many thousands of Navy personnel travel to and from work daily. Large numbers of civilians, sightseers and others also make use of water transportation. Especially in the case of the Navy, this travel is performed in low, relatively high speed power boats and the occupants are subject to an almost continual spray of Bay water. The food and fresh water supplies used on board ships moored in the Bay are likewise transported over Bay waters.

Three submarine pipelines, a 20", a 16" and an 8", transport water from the City of San Diego water system to North Island and the Navy Amphibious Base, the 8" line serving as a standby emergency connection to the California Water and Telephone Company's system which serves Coronado. These lines traverse a portion of the Bay where high coliform densities exist constantly. Examination of Plate 1 will show that during the 1952-54 sampling program the densities in that vicinity exceeded 10 per ml practically 100% of the time, the mean counts ranging from 57 to 111 per ml with maximums of from 240 to 350 per ml. This constitutes a potential cross connection of serious proportions and has been a matter of concern to water officials and the U. S. Navy.

While no definite standard for the particular situation found in San Diego exists, there appears to be general agreement that safe standards of bacterial density with regard to food and water transportation should be at least as restrictive as the recreational standard of 10 coliforms per ml, possibly more so, and that with regard to transportation of persons, a maximum density of somewhere between 10 and 50 coliforms per ml would be in order. A further study of Plate 1 will show that mean coliform densities throughout the area of concentrated use vary from 200 to 2,000 per ml, far in excess of any reasonable figure which may be used as the final criterion.

The sewage-laden waters of the area of maximum use constitute a public health menace of considerable significance and an impairment of water quality.

F. Water Quality as Related to Esthetic Considerations

Esthetic considerations are most difficult, if not impossible, to

evaluate on an economic basis - however, they cannot be ignored. Bearing, as it does in many ways, a direct and vital relationship to the welfare of every citizen of this area and for that matter of the County as a whole, San Diego Bay constitutes our greatest community asset, by far our main source of individual and community wealth and pride -actually the basic reason for our existence as a community. For these reasons alone, common sense and decency would seem to dictate the reasonableness of maintaining the Bay in a generally wholesome condition and of conserving its unexcelled natural beauty.

The presence of visible sewage solids, oily slicks and sludge accumulations, the reduction in dissolved oxygen concentrations, the changes in color, the increasing turbidity, the evidence of sewage-induced odors, and the increasing disease bearing potential all have exerted a marked effect on the Bay.

Unfortunately, it is impossible to predict just what the future holds in store in this regard. The natural capacity of the Bay to assimilate wastes having already been exceeded, further increments of wastes discharged will have a proportionately more serious effect, and to determine to what extent and in what manner we can continue to utilize the Bay for waste disposal and still avoid serious public health consequences, loss of industry and business, curtailment of navigational use, complete destruction of fish and wildlife resources, ruination of recreational opportunity, and nuisances is a problem the solution of which requires the best efforts of everyone.

To determine the beneficial uses of Bay water which must, in the

community interest, be safeguarded and to develop the regulatory waste disposal requirements which will insure their being safeguarded and at the same time equitably divide the waste receiving capacity of the Bay among the many waste disposers is the problem facing this Board. To say this will be a difficult problem to solve through regulation would be a gross understatement. Considering the rate of growth and the population ultimately to be served, the question is, can it be done at all? Suffice it to say that were the people of this area to find a practical way to remove the major discharges from San Diego Bay to a disposal point located elsewhere, the problem would be greatly simplified.

V. AREA-WIDE ASPECTS OF POLLUTION CONTROL

The sewerage problem of metropolitan San Diego is a complicated one involving many jurisdictions and overlapping interests and responsibilities. No phase of it can be discussed without considering its area-wide ramifications - certainly no effective long-range program for the control of pollution, nuisance, and health hazards can be developed without considering such factors as future volumes of waste, where they will be discharged, future port development, recreational planning, industrial expansion, and many others.

To begin with, over 90% of the population of the metropolitan San Diego area is already served by the San Diego system, adjacent cities and districts being served by San Diego under contract. Since cities and districts do not by virtue of such contracts relieve themselves of their legal responsibilities for adverse conditions resulting from waste disposal,

this Board must consider the sources of wastes as well as the end conditions. Within the metropolitan area there exist 22 separate sewerage jurisdictions involving 13 individual sewage treatment plants, the effluents from which drain into San Diego Bay or the Pacific Ocean, and in one case even into Mission Bay during certain periods of the year. Full port development, when achieved, will almost certainly affect beneficial use. The development of an outer harbor, now being advocated, would drastically alter the waste receiving capacity of North San Diego Bay and further aggravate the condition in the Central Bay. Large areas are presently considering annexation to San Diego or to cities served by the San Diego sewerage system. Typical of the situation, on the date this is being written two articles appear in the press informing the public of two potential annexations, one involving the annexation of $1\frac{1}{2}$ square miles of area to the City of La Mesa and the other the annexation of some 20 square miles or more to the City of San Diego. In each case, local problems - one of which involves the potential contamination of the drinking water supply of 20,000 persons - would be solved, but, in each case also, the burden would be shifted to already overloaded San Diego Bay.

But there are still other problems to consider. It is no longer possible to isolate the effects of the various discharges into the Bay and to solve any one of the smaller ones would produce no net benefits whatsoever. It cannot be overlooked that small sewage treatment plants are high in per capita construction and operating costs with the result that, too often, needed additions are delayed and operation is either inferior or non-existent. In turn, the inability of small areas to adequately cope

with the situation results in the discharge of inadequately treated sewage onto their downhill neighbors. In this connection, it was as a result of the foul conditions resulting from the discharge of inadequately treated sewage from the now abandoned La Mesa treatment plant onto the City of San Diego that the present joint arrangement between the two cities was consummated. Even today, sewage effluent from a County Sanitation District flows directly over the raw water pipeline which transports water from San Vicente Reservoir to San Diego, and sewage from the Tia Juana-San Ysidro area has affected the entire stretch of beach from the International Border to the southerly end of the Silver Strand. In unsewered areas in the environs of our cities, low capacity of the soil to absorb wastes from individual household systems has, in many cases and over a wide area, created foul insanitary conditions, a menace to the health not only of the residents of those areas themselves but of neighboring sewerred areas as well. The case involving the potential contamination of the water supply of 20,000 persons mentioned above is typical. In the absence of an orderly plan for sewerage, engineers faced with the designing of systems know neither the direction of flow nor the pipe capacity for which to plan.

Under these circumstances, it is only being realistic to state that no amount of regulation by this Board or any other agency of government can effectively and efficiently control pollution, nuisance, and public health menaces. The only way this can be done is through the construction of well-planned basic sewerage facilities. All we can hope to accomplish in the absence of such facilities is to handle the emergencies as they arise.

It is not our duty or purpose to suggest any particular plan, but we do earnestly recommend that the Board continue to exert its efforts and leadership to the end that some plan which will adequately solve the total problem will be soon developed, adopted and relentlessly pursued.

VI. SUMMARY OF WASTE DISCHARGES ENTERING SAN DIEGO BAY

A comprehensive discussion of waste discharges entering the Bay, together with waste flow and strength data is contained in Appendix I, pages 39-52 of the 1952 report. No important additions to the list of disposers shown in that report have occurred. There have, however, been changes in status of both municipal and industrial waste discharges.

Table 1 lists the municipal discharges and shows the current estimates of waste volume and strength for each. It is quite obvious that the City of San Diego is by far the principal waste contributor to San Diego Bay, and for that reason any solution to water pollution in the Bay must hinge upon an adequate solution to the City of San Diego problem. The average sewage flow in the City of San Diego has increased from 32 mgd in 1951 to 39 mgd in 1954. The population equivalent of the bacterial loading discharged by San Diego City is conservatively estimated at 490,000. This estimate, of course, includes the various naval installations using the city sewers, the City of La Mesa, National City, the Rolando Sanitation District, and the Lemon Grove Sanitation District. As shown in the table, this figure represents 94.5% of the total bacterial loading in San Diego Bay. Of the biochemical oxygen demand and suspended solids loading due to municipal and domestic wastes, the City of San Diego is responsible for 89% and 90% respectively.

TABLE 1

SANITARY SEWAGE DISCHARGED INTO SAN DIEGO BAY

DISCHARGER	TYPE	VOLUME mgd	TOTAL LOADING						REMARKS
			BOD lbs/day	%	Suspended Solids lbs/day	%	Bacterial Population Equivalent	%	
City of San Diego*	Municipal**	39.0	49,000	88.8	49,000	90.1	490,000	94.5	BOD and suspended solids loading include estimate for digested sludge discharge to bay.
City of Coronado	Municipal**	1.0	2,000	3.6	2,000	3.7	13,000	7.5	Based on discharge through Coronado outfalls.
City of Chula Vista	Municipal**	1.7	2,200	4.0	1,400	2.6	2,000	.4	Combined data from J Street and G Street plants.
Miscellaneous Harbor Front Wastes	Domestic	***	50	.1	50	.1	500	.1	Based on equivalent of workers in unsewered areas.
Naval Amphibious Base	Domestic	***	450	.8	450	.8	3,000	.6	Estimated total personnel 5,000
Naval Ships in Harbor	Domestic	***	1,500	2.7	1,500	2.7	10,000	1.9	Estimated total personnel 20,000
TOTAL		41.7	55,200	100.0	54,400	100.0	518,500	100.0	

*Includes National City, La Mesa, The Rolando and Lemon Grove Sanitation Districts and Navy Installations

**Mixed domestic and industrial waste

***No data available on volume of Navy discharges

The City of Coronado, the Naval Amphibious Training Base, the active ships in the harbor, and the as yet unsewered portion of the harbor front continue to discharge raw sewage to the harbor. Since 1951, sewers have been provided for two-thirds of the harbor area which then discharged directly into the Bay. Sewers for the rest of the area are under study by the San Diego Harbor Department.

The City of Coronado now has under construction pumping stations on its two outfalls. The pumping stations are a first step in a program to correct the discharge of crude sewage into the Bay. Although the stations will initially be used for pumping raw sewage through the existing outfalls, the Coronado City Council has filed with this Board Resolution #2429 agreeing that as a condition of approval of its proposal, the City will take specific steps to eliminate its contribution to Bay pollution and contamination as soon as the area-wide sewerage planning problems are resolved. The resolution gives official recognition to the urgent need for eliminating pollution at the earliest possible date consistent with good planning. It will be recalled that three years ago officials of Coronado met with this Board and requested and were granted permission to delay the undertaking of remedial measures until a decision relative an area-wide solution is reached.

The City of Chula Vista provides primary treatment at two plants; disinfection in addition to primary treatment being effected at its main treatment plant on J Street. Figure 1 pictorially illustrates the proportions of waste contributions to San Diego Bay by the various agencies.

SOURCES OF WASTE LOADINGS DISCHARGED INTO SAN DIEGO BAY

BACTERIOLOGICAL

BIOCHEMICAL OXYGEN DEMAND

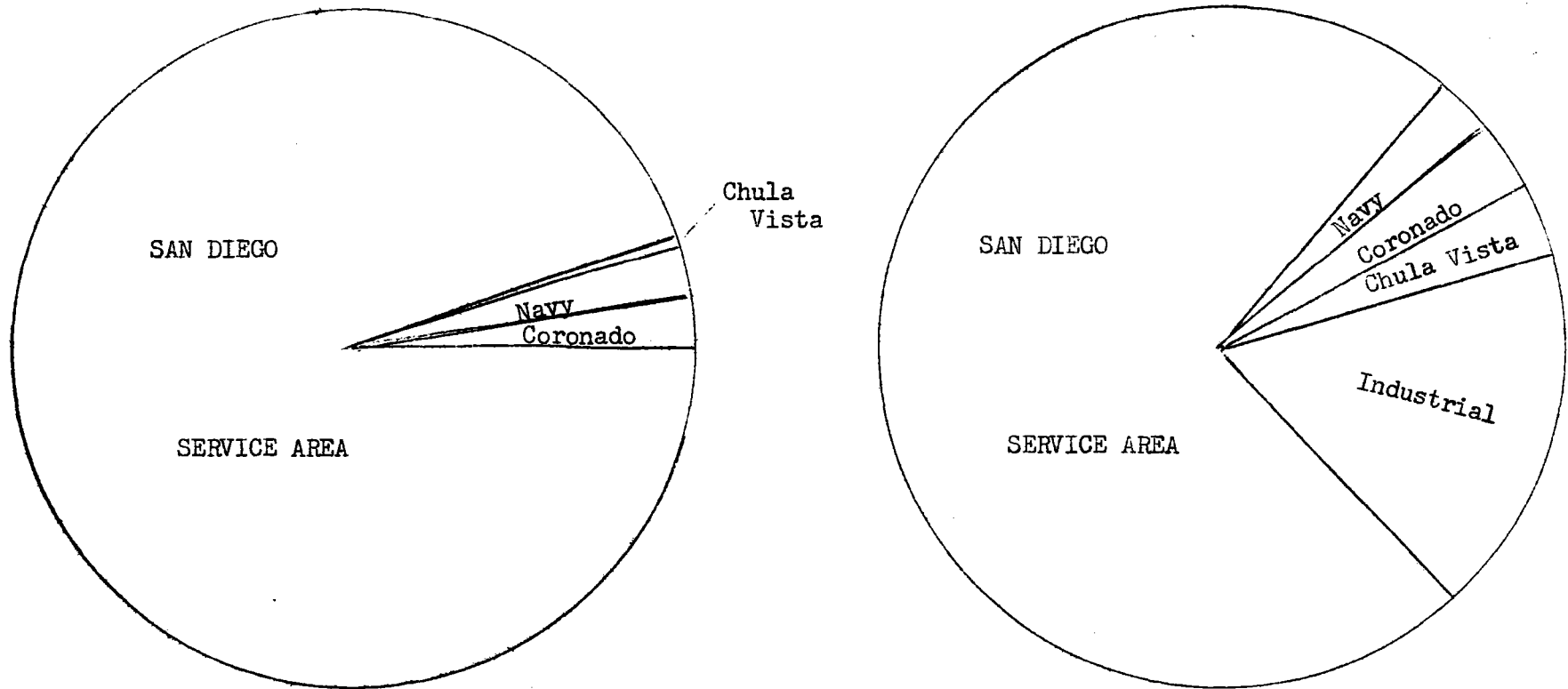


FIGURE 1

Because numerous changes in industrial waste discharges have taken place since 1951, a complete resurvey of that problem is necessary. At the time of the 1952 report, there were five fish canning plants on the bay front. This has now been reduced to three. Although a marked reduction in total production took place in 1951, 52, and 53, the number of cases of fish canned is once more approaching the peak production years. However, advances in the handling of inplant wastes have been made by at least one cannery.

The American Processing Company now disposes of sanitary wastes into the city sewers and no longer engages in fish and fish offal reduction. In 1952 this was considered to be the major source of wastes discharged by American Processing Company. Westgate-California Tuna Packing Company continues to reduce fish offal in their own facilities, and the Van Camp Sea Food Company has installed fish reduction equipment.

The Kelco Company, manufacturers of products from the giant kelp, has since 1951 reduced by 15% the suspended solids which it discharges to the Bay and has a program in progress through which it proposes to reduce the suspended solids in its wastes to a negligible amount. It is expected that this program will be completed within three years. The company feels that the solution to the oxygen demand waste problem can best be solved by connection to the city sewerage system when additional capacity is available.

Other industrial wastes disposed of in San Diego Bay are principally inorganic in nature and the basic concern is with toxic substances detrimental to aquatic birds and marine life. The Rohr Aircraft Corporation,

which discharged all of its industrial waste to San Diego Bay with little or no dilution in 1951, has undertaken a program of waste disposal control. All concentrated wastes are now collected separately and disposed of by dumping at approved sites or at sea under adequate supervision. Some treatment facilities have been installed and measures have been adopted to reduce the concentration of toxic materials in the wastes in accordance with the requirements of this Board which were set in January 1953.

With only minor exceptions, industrial wastes do not contribute to the bacterial loading on the Bay. Programs under way will greatly reduce the total industrial suspended solids loading. In some cases it will be necessary for industry to undertake remedial programs on their own; however, industry has a right to depend on the community for certain minimum sewerage services, and until those services are available the industrial, like the domestic, waste disposal problem cannot be fully solved.

VII. REVIEW OF RESPONSIBILITIES AND DUTIES OF THE BOARD

To achieve effective prevention and control of water pollution and nuisance as related to the disposal of sewage and industrial waste, the California Water Pollution Act confers upon the Regional Water Pollution Control Board four principal duties and powers:

- (1) Obtaining coordinated action in controlling pollution.
- (2) Formulating and adopting long-range plans and policies with respect to water pollution control.
- (3) Prescribing regulations for waste discharges.
- (4) Enforcing orders for correcting pollution by means of administrative hearings, followed, if necessary, by court action.

When it became apparent, early in 1950, that a serious sewerage problem existed throughout metropolitan San Diego and that the discharge of sewage and industrial waste into San Diego Bay was creating adverse conditions, this Board, after consultation with local officials and others having responsibilities in this regard, undertook the fulfillment of the foregoing responsibilities through two initial steps:

(1) To achieve coordinated action, it requested the governing bodies of the metropolitan cities and of the County to appoint members to a sewerage planning committee whose duty it would be to study and make recommendations for the long-range solution of the sewerage problem, and

(2) It undertook a comprehensive investigation of the extent, effects and limitation of waste disposal into San Diego Bay aimed at obtaining a broad basis of fact from which it could develop a practical, long-range program of water pollution control.

With reference to the former, we are all familiar with the work of the sewerage planning committee which resulted in the conduct of the San Diego County Sewerage Survey, the final report on which contains full data and information upon which to base plans, together with numerous basic long-range plans, to permanently solve the sewerage problems of the county.

The studies relating to the Bay were conducted during 1950, 51, and 52, and in December 1952 the Board published its final report entitled "Report Upon the Extent, Effect and Limitations of Waste Disposal Into San Diego Bay." The report, which contains complete substantiating data, showed that the quality of water in the Bay was at that time impaired as regards existing beneficial uses and that the waste loading limits of the

portion of the Bay where the major waste discharges take place had been reached. Based on the information and data derived from the studies, the Board adopted Long-Range Waste Disposal and Water Quality Objectives for San Diego Bay which were reproduced in the final report. The report was widely disseminated among officials, civic organizations and libraries and it received publicity in the press, on radio and television and by means of talks to civic groups.

We do not believe that we are being over optimistic to state that with all the basic data needed at hand and with the public generally aware of the problem, a solution will soon be forthcoming. Fortunately, the defeat of the recent bond issue did not result in a slackening in interest - in fact, interest seems to have intensified. The fact remains, however, that as of now no specific plan has been authorized by the voters and, since there is no definite assurance that this will soon be accomplished, the Board must consider the steps necessary to fulfill its statutory responsibilities.

The following Sections of the Water Pollution Control Act are pertinent:

13053. "Each regional board shall prescribe requirements relative to any particular condition of pollution or nuisance, existing or threatened, in the region.

13060. "When it appears to a regional board that the discharge of sewage or industrial waste within its region is taking place contrary to any requirements prescribed by the regional board under the provisions of Sections 13053, 13054, and 13055, the board shall order a hearing on the

matter and serve notice thereof by registered mail, not less than 10 days prior to the hearing on all persons alleged to be creating the condition.

13061. "Hearings held under the provisions of this article shall be conducted, as nearly as practicable, in accordance with the provisions of Title 2, Division 3, Part 1, Chapter 5 of the Government Code and the regional board shall have all powers granted therein as an agency of the State.

13062. "After hearing, the board shall make its findings as to whether pollution or nuisance is existing or threatening. If the board finds affirmatively, it shall thereupon order correction."

Section 13063 is too lengthy to duplicate here, but it provides that upon failure of any person to comply with the orders of the regional board, the board shall refer the matter for court action.

Two features of the above Sections are of particular significance:

(1) Section 13053 makes it mandatory, not permissive for the board to prescribe requirements when a pollution exists or is threatened; and

(2) No order for correction can be issued by the board until requirements have been prescribed.

Once requirements have been prescribed, the course of action is clearly outlined in Sections 13060 through 13063.

There appears to be no question as to the board's authority to proceed with the prescribing of requirements under Section 13053, in fact, had it not been for the fact that plans for the removal of wastes from the Bay were being formulated and considered this would probably have been done

some time ago. It would be advisable, however, to consult with the Attorney General's office on the legal technicalities involved and to determine if there are any complications involving cities and districts being served by the City of San Diego.

VIII. RECOMMENDATIONS

Based on the foregoing considerations, the staff recommends that:

1. Preliminary to such action as the Board may deem it necessary to take under Sections 13060, 13061, 13062 and 13063 of the Water Code, the staff be directed to prepare and submit for Board adoption tentative requirements involving all significant discharges of waste into San Diego Bay.

2. The situation be reviewed with the Attorney General's Office and the advice and guidance of that office as to legal aspects be obtained.

3. The Board hold at least one meeting during each of the next five months; part of each meeting to be set aside for the purpose of considering and discussing with appropriate officials, in turn, each significant case of waste disposal into San Diego Bay.

4. To aid in the development of sound requirements, the Board:

a. Consider holding public hearings to assist it in determining the beneficial uses to be safeguarded.

b. Authorize the staff to designate advisors, representative of the several water uses, to assist it in development of tentative waste discharge requirements.

c. Request the City of San Diego to furnish, for the months of October, November and December, 1954, monthly reports of analyses of

sewage treatment plant effluent to include:

- (1) Five-day BOD (daily refrigerated sample)
- (2) Suspended solids (daily composite sample)
- (3) Grease and oil (1 day composite sample once a week)
- (4) Daily mean and maximum flows
- (5) Coliform density (MPN) (one sample daily, taken

between the hours of 10 A.M. and 4 P.M.)

d. Direct the staff to undertake the following additional investigations in cooperation with such agencies and individuals as can and are willing to contribute:

- (1) Regular program of shore and off-shore bacteriological and dissolved oxygen determinations.
- (2) Such additional bottom mud data as can be obtained.
- (3) Case by case re-evaluation of industrial waste discharges.
- (4) Periodic sampling of municipal discharges other than from the City of San Diego sewage treatment plant.

5. The Board continue its efforts to achieve an adequate, long-range solution to the sewerage problem of this area through cooperation with and coordination of the several interests involved.