

California Regional Water Quality Control Board  
Santa Ana Region

**RESOLUTION NO. 00-100**

Resolution Approving Plans Submitted in Compliance with the Requirements of the Total Maximum Daily Load for Fecal Coliform in Newport Bay

WHEREAS, the California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Board), finds that:

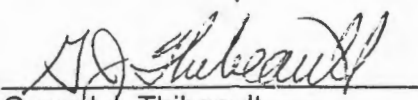
1. On April 9, 1999, the Regional Board adopted Resolution No. 99-10, which amended the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) to incorporate a Total Maximum Daily Load (TMDL) for fecal coliform in Newport Bay. The TMDL was subsequently approved by the State Water Resources Control Board, the Office of Administrative Law, and the U.S. Environmental Protection Agency.
2. The TMDL includes a fecal coliform implementation plan and schedule (Table 5-9g). This implementation plan requires the submittal of a number of proposed plans to conduct monitoring and other investigations. The TMDL requires that these plans be implemented in accordance with specific time periods after Regional Board approval of the plans.
3. The County of Orange, the Cities of Irvine, Tustin, Newport Beach, Lake Forest, Santa Ana, Orange and Costa Mesa, The Irvine Company and agricultural operators in the watershed were identified as parties responsible for fecal coliform discharges to Newport Bay.
4. In a January 7, 2000 letter to the responsible parties, the Regional Board's Executive Officer requested the submittal of the plans required by the TMDL. This request was made pursuant to the authority provided by Water Code Section 13267.
5. The Orange County Public Facilities and Resources Department (OCPF&RD) responded to the January 7, 2000 letter on behalf of the responsible parties in letters dated January 28, 2000, March 1, 2000, and March 31, 2000, and in e-mail correspondence on October 20, 2000. This correspondence provided proposed plans to: (1) conduct routine bacterial quality monitoring; (2) develop a fecal coliform transport and fate model; (3) conduct an assessment of REC-1 (water contact recreation) use in the Bay; (4) identify and characterize sources of fecal coliform input for (a) the Dunes Resort; (b) urban runoff (including stormwater), (c) agriculture (including stormwater) and (d) natural sources; and (5) evaluate the vessel waste program. The University of California Cooperative Extension, acting on behalf of the agricultural operators, submitted a report regarding the characterization of agricultural runoff as a source of fecal coliform inputs.
6. Staff has reviewed these proposed plans and finds that the plans to develop the fecal coliform fate and transport model, to conduct the REC-1 beneficial use assessment, to identify and characterize sources of fecal coliform input to the Dunes Resort, to identify and characterize sources of fecal coliform in agricultural runoff, and to

evaluate the vessel waste program are adequate. The plans to identify and characterize sources of fecal coliform input via urban runoff and natural sources are not adequate.

NOW, THEREFORE, BE IT RESOLVED THAT:

The Regional Board approves the plans for development of the fecal coliform transport and fate model, the REC-1 beneficial use assessment, identification and characterization of sources of fecal coliform input to the Dunes Resort, identification and characterization of sources of fecal coliform in agricultural runoff, and evaluation of the vessel waste program.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, Santa Ana Region, on November 17, 2000.

  
Gerard J. Thibeault  
Executive Officer

California Regional Water Quality Control Board  
Santa Ana Region

November 17, 2000

ITEM: 15

SUBJECT: Total Maximum Daily Load for Fecal Coliform in Newport Bay:  
Consideration of Plans Submitted to Fulfill TMDL requirements  
(Resolution No. 00-100)

DISCUSSION:

On April 9, 1999, the California Regional Water Quality Control Board, Santa Ana Region (Regional Board), adopted Resolution No. 99-10, which amended the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) to establish a Total Maximum Daily Load (TMDL) for fecal coliform in Newport Bay. A copy of the TMDL is attached to this report.

The objective of the fecal coliform TMDL is to address bacterial water quality problems in Newport Bay that adversely affect its beneficial uses, including water contact recreation (REC-1) and shellfish harvesting (SHEL). These problems are described in the attachment ("3. Bacterial Contamination", page 1-2). Briefly, due to consistently high levels of total coliform bacteria, the upper portion of Upper Newport Bay (Upper Bay) has been closed to these uses since 1974. In 1978, the shellfish harvesting prohibition area was expanded to include all of the Upper Bay, and the Orange County Health Care Agency (OCHCA) generally advises against the consumption of shellfish harvested anywhere in the Bay. The bacterial objectives specified in the Basin Plan to protect shellfish harvesting activities are rarely met in the Bay. These objectives are significantly more stringent than those established to protect water contact recreation. In general, there is good compliance with the water contact recreation objectives in the summer (dry weather). However, certain areas of the Upper and Lower Bay are closed to water contact recreation on a temporary basis in response to wet weather. The Basin Plan bacterial quality objectives for both SHEL and REC-1 protection are based on fecal coliform bacteria. (It may be noted that the OCHCA, which is responsible to post areas to warn against water contact recreation and shellfish harvesting, relies on a suite of bacterial indicators to assess public health risk (total coliform, *E. coli*, and enterococcus), pursuant to AB 411).

Data collected by the OCHCA demonstrate that tributary inflows, composed of urban and agricultural runoff, including stormwater, are the principal sources of coliform input to the Bay. As expected, there are more violations of bacterial standards in the Bay during wet weather, when tributary flows are higher, than in dry weather. There are few data on the exact origin of the coliform in this runoff, but sources



include manure (applied to agricultural crops and commercial and residential landscaping); fecal wastes from humans, household pets and wildlife; and food wastes from restaurants.

Table 5-9f shows the fecal coliform TMDL and the wasteload allocations and load allocations assigned to the identified sources. The TMDL is the density of fecal coliform organisms per volume of water. (It is the density of these organisms, and not their total number (or "load") that is significant with respect to the protection of beneficial uses. Thus, the TMDL is based on density rather than load.) The densities established in the TMDL are equivalent to the Basin Plan fecal coliform objectives for REC-1 and SHEL, with compliance to be achieved as soon as possible but no later than 2013 and 2019, respectively. As seen in this Table, a comparable approach is taken in specifying the wasteload and load allocations. The only exceptions are the allocations for vessel waste discharges. Wasteload allocations of zero are specified, reflecting the designation of Newport Bay as a "no discharge" harbor for vessel sanitary wastes.

Table 5-9g outlines an implementation plan leading to compliance with the TMDL and the REC-1 and SHEL water quality objectives. This plan requires that a series of tasks be implemented, resulting in the development of an updated TMDL report (Task 9). Based on the updated TMDL report, the TMDL would be adjusted, if necessary, and interim wasteload and load allocations and schedules would be established. This phased approach was adopted in recognition of the limited data used in the development of the TMDL and the need to conduct investigations to assure that any requisite control measures are justified and reasonable.

Table 5-9g requires that proposed plans be submitted to implement the tasks identified therein. It also specifies that the plans are to be implemented within specified time frames once the plans are approved by the Regional Board.

Orange County, the Cities within the watershed (Santa Ana, Costa Mesa, Newport Beach, Orange, Lake Forest and Tustin), The Irvine Company and agricultural operators in the watershed are responsible for fecal coliform discharges to Newport Bay. These parties are thus responsible to prepare the plans required by the TMDL and to implement them once approved by the Board. Accordingly, on January 7, 2000, the Board's Executive Officer sent a letter to these parties, requesting the submittal of proposed plans in accordance with the TMDL requirements. These plans are to address the following areas stated in the TMDL:

1. *Routine Monitoring Program*
2. *Water Quality Model for Bacterial Indicators*
3. *Beneficial Use Assessment*
4. *Source Identification and Characterization –  
Fecal coliform inputs to (a) the Dunes Resort, and fecal coliform inputs to Newport Bay from (b) urban runoff, including stormwater, (c) agricultural runoff, including stormwater, and (d) runoff from natural sources.*
5. *Evaluation of Vessel Waste Control Program*

The Orange County Public Facilities and Resources Department (OCPF&RD), on behalf of all the parties, responded to the 13267 letter with 3 subsequent letters dated January 28, March 1, and March 31, 2000 which addressed items 1, 2, 3; 4(a & b); and 4(c&d), 5, respectively. On behalf of the agricultural operators, the University of California Cooperative Extension submitted a proposal regarding the characterization of agricultural inputs. Upon review of these letters, Board staff met with OCPF&RD staff on Sept. 11, 2000, to discuss the plans proposed in the above-mentioned letters. Board staff then sent (by email – October 5, 2000) a meeting summary and recommendations for plans for tasks that are not completed or for which Board staff had remaining concerns regarding the adequacy of the plans. OCPF&RD then sent a return response by email (October 20, 2000) to Board staff's recommendations. Board staff also met with staff of the University of California Cooperative Extension to review the proposed agricultural source identification and characterization plan.

The following is a summary of these discussions, listed by task.

**1. Routine Monitoring Program** – The Orange County Health Care Agency (OCHCA) currently has a monitoring program by which weekly samples are collected at various Bay and tributary sites, and analyzed for total coliform, *E. coli*, and enterococci. This program meets most of the requirements for the TMDL; however, it does not monitor fecal coliform, which is required by the Basin Plan and the TMDL. Board staff indicated a willingness to consider the use of *E. coli* as a surrogate for fecal coliform, provided that a relationship could be demonstrated between *E. coli* and fecal coliform in Newport Bay waters.

Data were presented by Doug Moore (OCHCA) that demonstrated a significant relationship between *E. coli* and fecal coliform for ocean samples; however, no such relationship has been demonstrated for Newport Bay samples.

**Recommendation:** Board staff recommends that the Board not approve the proposed routine monitoring plan but instead adopt requirements for the implementation of fecal coliform monitoring (Item 16).

**2. Water Quality Model for Bacterial Indicators** – A Health Risk Assessment (HRA) is being conducted for the Bay under the auspices of many of the watershed stakeholders. The development of a water quality model capable of evaluating bacterial inputs and fate is a key component of that effort. The development of that model is already underway, with Board staff participation. Staff believes that this model effort satisfies this requirement of the TMDL, provided that the model is capable of analyzing fecal coliform inputs to the Bay. Assurances have been provided that this is the case.



**Recommendation:** Board staff recommends that the Regional Board approve the proposed plan for water quality model development, provided that the model is capable of analyzing fecal coliform inputs to Newport Bay.

3. **Beneficial Use Assessment** – The Health Risk Assessment also includes the assessment of water contact recreational (REC-1) activities in Newport Bay. An acceptable assessment has already been completed. (A workplan to conduct the SHEL assessment is due February 1, 2001.)

**Recommendation:** Board staff recommends that the Regional Board approve the plan for the REC-1 beneficial use assessment.

4. **Source Identification and Characterization – including fecal coliform (FC) inputs to (a) the Dunes Resort, (b) Newport Bay from urban runoff, including stormwater, (c) Newport Bay from agricultural runoff, including stormwater, and (d) Newport Bay from natural sources.**

**(a) FC inputs to the Dunes Resort** – On behalf of the City of Newport Beach, Board staff is overseeing the conduct of a genetic testing program designed to evaluate sources of pathogen inputs to the Bay. OCPF&RD proposed that one task (Dunes shedding study) of the City of Newport Beach contract would satisfy the source identification and characterization requirements for the Dunes Resort. Staff believes that this proposal is valid; however, staff put OCPF&RD on notice that since more money was required for the genetic sampling plan than was originally anticipated, the Dunes study will most likely require additional funds beyond those obtained in the Newport Beach contract. The Newport Bay Genetic Sampling Group (Board staff, City of Newport Beach, OCHCA, and Southern California Coastal Research Project (SCCWRP)) will design a study over the winter to address fecal coliform inputs to the Dunes Resort, and implement this study in summer 2001.

Board staff is in agreement with this approach.

**(b) FC inputs to Newport Bay - Urban Runoff** – OCPF&RD proposed that the monitoring plan currently being carried out by the Irvine Ranch Water District (IRWD) for the Health Risk Assessment be used to satisfy the source identification and characterization requirements of FC inputs from urban runoff. In this monitoring program, IRWD collects samples from 4 locations weekly, and from 16 locations biweekly and analyzes for total coliform, fecal coliform and MS2 phage. Board staff advised OCPF&RD of our concern that this proposal would not be adequate since it would not distinguish urban runoff from other types of inputs. OCPF&RD responded that it would be appropriate to rely on the HRA to determine whether sources created a bacterial quality problem in Newport Bay recreational areas. OCPF&RD argues that under their recommended approach, it would be unnecessary to partition fecal coliform loads into separate source categories (i.e., urban, agricultural, natural), unless the load from a particular tributary or drain was shown to be a health risk in the Bay (via the HRA water quality and risk assessment

models). OCPF&RD recommended that preliminary characterizations be conducted, including the development of a simple fecal coliform budget based on available information, small-scale wildlife assessments (to evaluate natural source inputs, see (d)), and utilization of information from other studies (Huntington Beach, Aliso Creek (in the San Diego Region)) regarding the sources, fate and transport of bacterial indicators.

While Board staff believes that such characterizations would have merit, we are not persuaded that the proposal is adequate to address the requirements of the TMDL. Moreover, we are not persuaded of the validity of the underlying premise of OCPF&RD's arguments, that is, that characterizations are not necessary unless a problem is demonstrated by the HRA. Finally, it is not clear when the HRA will be completed, given current controversy about the pathogen indicators proposed for use therein.

Board staff proposes to continue to work with the stakeholders to develop an acceptable urban runoff characterization plan.

**(c) FC inputs to Newport Bay - Agricultural Runoff** – Board staff met with staff of the U.C. Cooperative Extension (UCCE) on October 17, 2000 to discuss this task. UCCE is taking the lead for the Orange County Farm Bureau and area farmers to comply with the TMDL. UCCE has agreed to add the monitoring of fecal coliform to a nutrient study that is currently being set up. This study will look at runoff from various representative agricultural sites in the Newport watershed.

Board staff is in agreement with this approach.

**(d) FC inputs to Newport Bay - from natural sources.** OCPF&RD proposed to estimate FC inputs from natural sources via back calculations from the water quality model. What this means is that FC inputs from urban and agricultural runoff will be subtracted from the total FC inputs (and outputs), and the remainder will be attributed to natural sources.

Board staff has some concerns with this approach and would prefer to develop an independent estimate of FC inputs from natural sources. For example, FC loading from natural sources could be estimated from wildlife population surveys of Newport Bay since FC loading estimates for various wildlife populations are likely to be found in the literature. The Department of Fish & Game or the U.S. Fish & Wildlife Service or the Audubon Society are likely to have wildlife population estimates for Newport Bay. OCPF&RD agreed to investigate such studies for preliminary characterization.

However, as alluded to in the discussion of the urban runoff characterization plan, there appears to be a fundamental difference of opinion with respect to this task. Board staff believes that it is necessary to differentiate fecal coliform inputs due to urban runoff, agricultural runoff and natural sources so that independent estimates can be input to the water quality model, and so that efforts at source control can be



directed towards the correct dischargers. It is important to have independent estimates to enter into the water quality model so that total inputs may be checked against partial inputs. It is also important to have realistic estimates for each source so that control efforts may be targeted in the right direction. These control efforts may include education programs to residential households compared to outreach concerning public interaction with wildlife populations compared to education of farmers. However, OCPF&RD proposes to use the water quality model followed by the microbial risk model (health risk model) to determine if the current loads of FC are in fact a health risk to the public at high use sites, and then differentiate FC sources.

Board staff believes that realistic estimates of FC inputs from natural sources are necessary for compliance with the source identification/characterization of the TMDL and that estimates may be obtained without large expenditures to the stakeholders.

Board staff proposes to continue to work with the stakeholders to develop an acceptable natural source input characterization plan.

**Recommendation:** Board staff recommends that the Board approve the plans to identify FC inputs to the Dunes Resort and to evaluate FC inputs from agricultural runoff.

**(5) Evaluation of Vessel Waste Control Program** – OCPF&RD proposed that one task (Vessel Waste study) of the City of Newport Beach contract (genetic sampling plan) would satisfy this TMDL task. Staff believes that this proposal is valid; however, staff put OCPF&RD on notice that since more money was required for the genetic sampling plan than was originally anticipated, the vessel waste study will most likely require additional funds beyond those obtained in the Newport Beach contract. The Newport Bay Genetic Sampling Group (RWQCB, City of Newport Beach, OCHCA, SCCWRP) will design a study over the winter to address the control of vessel waste, and implement this study in summer 2001.

Board staff is in agreement with this approach.

**Recommendation:** Board staff recommends that the Board approve the proposed plan to evaluate the vessel waste control program.

#### OTHER ISSUES:

As explained above, the implementation of the various tasks required by the TMDL is contingent on the Board's approval of the plans proposed to carry out those tasks. For the most part, Board staff believes that the plans submitted are adequate and should be approved by the Board. However, we believe that additional work is necessary on the plans to conduct urban runoff and natural source characterizations. This work will need to be completed before these plans can be



recommended to the Board for approval. Staff is concerned that the Board approval process (and, thus, implementation of these tasks) might be delayed if a Board quorum is not available in the near future. Therefore, staff recommends that the Board delegate to the Executive Officer the authority to approve these plans, should it become necessary in the absence of a quorum.

**RECOMMENDATION:**

Adopt Resolution No. 00-100, approving the plans proposed to fulfill TMDL requirements as recommended by Board staff and authorizing the Executive Officer to approve the refined plans for the identification and characterization of urban and natural source fecal coliform inputs, if necessary.