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STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING SESSION – DIVISION OF WATER QUALITY
[DATE – TBD], 2009

ITEM #

SUBJECT

CONSIDERATION OF A RESOLUTION APPROVING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN FRANCISCO BAY REGION (BASIN PLAN) TO ESTABLISH A TOTAL MAXIMUM DAILY LOAD (TMDL) AND IMPLEMENTATION PLAN FOR PATHOGENS IN RICHARDSON BAY

BACKGROUND

On July 9, 2008, the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Water Board) adopted Resolution R2-2008-0061 to amend the Basin Plan to establish a TMDL for pathogens in Richardson Bay. Richardson Bay is listed as impaired under section 303(d) of the Clean Water Act resulting from high coliform bacteria levels. Monitoring results indicate that Richardson Bay exceeds bacteria water quality objectives that protect the beneficial uses of shellfish harvesting (SHELL) and water contact recreation (REC1). Placement of Richardson Bay on the 303(d) list requires that a plan (i.e., a TMDL) be developed to control the pollution and to ensure that all beneficial uses are protected.

Richardson Bay is a small arm of the San Francisco Bay, located just northeast of the Golden Gate Bridge in southern Marin County. It is widely used for recreational activities including boating, kayaking, rowing, and swimming. Richardson Bay is protected from strong tides and winds by the Marin Headlands and Tiburon Peninsula, and provides an important shelter for sea birds and migratory waterfowl during the winter months. Inhabitants include some species of concern and the California Clapper Rail, a non-migrating endangered species. Richardson Bay provides habitat and refuge for harbor seals, spawning grounds for herring, and important spawning and feeding areas for other fishes, including year-round residents, migrating anadromous fish, and pelagic ocean visitors.

Monitoring results for Richardson Bay show high levels of fecal coliform. The presence of pathogens is inferred from high concentrations of fecal coliform bacteria, a commonly used indicator of human pathogenic organisms. Pathogens in the water pose a health risk to people who are exposed, either through incidental ingestion of water (through recreational activities such as swimming, fishing, boating, tide pool activities, etc.), or through the consumption of contaminated shellfish. Richardson Bay has poor pollutant dispersion capability and low assimilative capacity due to its enclosed shape, shallowness, and minimal tidal flushing action. Sewage (human wastes) and graywater (galley, bath, and shower water) from houseboats, recreational vessels, sanitary sewer systems, and stormwater runoff contribute to pollution within Richardson Bay. Fecal contamination from improper disposal of human waste can result in human health hazards, beach closures, shellfish contamination, and loss of recreational opportunities. Sewage discharges also impair the health of the aquatic environment by stimulating algae growth, which can in turn reduce the oxygen needed by fish and other organisms.

It is estimated that there are more than 400 houseboats in Richardson Bay. These houseboats are used primarily as floating homes, since they are not designed for self-propelled navigation. Although all houseboats in Richardson Bay have been hooked up to sewers, the adequacy,

integrity, and reliability of these sewage systems remain questionable. Water quality monitoring in Richardson Bay clearly shows that the houseboat harbors consistently exhibit the highest number of excursions above water quality objectives in Richardson Bay. Episodic and/or chronic sewage discharges from faulty and un-maintained systems are most likely the cause. Sewage system failures have also been repeatedly observed during sampling events.

Because of its sheltered location, size, and proximity to the cities of Sausalito and San Francisco, Richardson Bay is especially desirable as an anchorage and harbor for recreational and small commercial vessels. Based on a marina survey conducted by the California Department of Boating and Waterways in August 2004, there are now approximately 2,400 recreational marina berths in Richardson Bay. In addition, approximately 500 transient boats visit Richardson Bay each year. Historic and recent Richardson Bay water quality monitoring results indicate that specific marinas have shown consistent high levels of pathogen pollution in Richardson Bay. As a result, it is likely that the boats and marinas are a source of the pathogens.

The cities of Sausalito, Mill Valley, Tiburon, and Belvedere are served by sanitary sewer systems. Sanitary sewer overflows from these systems may be a source of pathogen pollution to Richardson Bay. Sanitary sewer overflows and other failures usually occur during and after rainstorms, when stormwater infiltrates sanitary sewers and overloads system capacity. During the time period from December 1, 2004 to May 2, 2007, 151 sanitary sewer overflows were reported.

Stormwater runoff may contribute seasonal discharges into Richardson Bay. Most of the land in the Richardson Bay basin consists of “urban area” land use. Stormwater runoff delivers pathogens to surface waters from pets, trash, wildlife, and in some cases human waste from homeless populations. Stormwater runoff also facilitates sewage progression from sanitary sewer overflows to Richardson Bay.

Monitoring indicates that bacteria levels are low in areas that contain wildlife, but that have minimal impact from human activities. This suggests that wildlife may not be a significant source of pathogens in Richardson Bay. However, wildlife may be a significant source on an intermittent, localized basis. Since wildlife as a source is not readily controllable, it will not be addressed in the implementation plan for this TMDL.

This TMDL will achieve protection of the more sensitive shellfish harvesting beneficial uses by establishing a density-based numeric target of <14 coliform organisms/100 milliliters (mL). This numeric target is protective of both SHELL and Rec1 beneficial uses in Richardson Bay, and incorporates an inherent margin of safety.

TMDL TARGETS AND ALLOCATIONS

For most pollutants, TMDLs are expressed on a mass-load basis (e.g., kilograms per year). However, for pathogen indicators such as fecal coliform, it is the number of organisms in a given volume of water (i.e., density), and not total number (or mass) that is significant to public health risk and protection of beneficial uses. The TMDL is the total number of fecal coliform organisms that can be discharged from all sources, while not causing water quality in Richardson Bay to exceed a five-sample-per-month median fecal coliform density of 14 organisms/100 mL, and with no more than 10 percent of all water samples exceeding 43 organisms/100 mL in a 30-day period. This TMDL will be applicable year-round. Shellfish harvesting in Richardson Bay can occur at any time of the year. Recreational uses of Richardson Bay are most prevalent during

the summertime, but can also occur at any time of year. Therefore, there are no seasonal variations for the TMDL and proposed load allocations. Also, because the load allocations in this TMDL are identical or more stringent than the existing numeric water quality objectives which are established as protective standards and inclusive of all uncertainties, the margin of safety is implicitly incorporated into the proposed TMDL and the proposed load allocations.

To achieve the TMDL, a density-based load allocation has been set for houseboats, vessels, sanitary sewer systems, stormwater runoff, and wildlife. Because they are density-based allocations, they do not necessarily equal the proposed TMDL. A zero load allocation has been assigned for houseboat, vessel, and sanitary sewer systems discharges which is consistent with the San Francisco Bay Region's Basin Plan sewage/wastewater discharge prohibitions for Richardson Bay (Discharge Prohibitions 5, 15, and 18). For stormwater and wildlife pollutant sources, a <14 organisms/100 mL median fecal coliform density allocation will be applied.

IMPLEMENTATION

The San Francisco Bay Water Board has the regulatory authority to require implementation of this TMDL under California Water Code section 13242. As with many TMDLs, the implementation plan for reducing pathogens in Richardson Bay relies primarily on existing regulatory controls and the sections of the Water Code that establish the San Francisco Bay Water Board's authority to enforce the provisions. Source categories of concern that are included in the implementation plan are sanitary sewer systems, stormwater runoff, houseboats, and water vessels (recreational, live-aboard, and anchor-out boats). The implementation plan will rely on compliance with Waste Discharge Requirements (WDRs), National Pollutant Discharge Elimination System (NPDES) permits, applicable stormwater management plans, as well as current vessel discharge prohibitions enforced by the Richardson Bay Regional Agency. Implementation measures will include evaluation of operating practices, identification of comprehensive site-specific pathogen control measures with an associated implementation schedule, and submittal of progress reports to the San Francisco Bay Water Board documenting actions taken.

Sanitary sewer systems in Richardson Bay are maintained by 10 local agencies that operate under general WDRs which require agencies to prepare and implement Sewer System Management Plans (SSMPs). An SSMP requires measures to contain sanitary sewer overflows, identify structures needing repair, and develop a preventive maintenance program. It also requires monitoring and reporting of effectiveness of actions and controls.

The Richardson Bay stormwater runoff program is managed by the Marin County Stormwater Pollution Prevention Program. Stormwater runoff into the Richardson Bay Watershed is regulated through federal NPDES stormwater permit requirements. Some additional implementation measures or management programs may be needed in order to reduce pathogens in stormwater runoff and will be included in the Marin County Stormwater Pollution Prevention Program's stormwater management plan. For the most part, these implementation measures would extend existing programs. For example, outreach to local residents on runoff may be expanded to include a description of specific sources of pathogens in the watershed (such as pet waste or leaking sewage handling systems) and information about how to reduce or eliminate these sources.

The TMDL requires the Richardson Bay Regional Agency, Marin County, and local cities to develop a plan and implementation schedule for evaluating the performance and integrity of the sewage collection systems that serve all houseboats and vessels in Richardson Bay. As with the

requirements for houseboats, the TMDL requires houseboat and vessel marina owners to develop a plan and implementation schedule for bringing identified substandard systems to proper operating standards. Marina owners will be required to install and maintain an adequate number of pump-out systems. Both houseboat and vessel owners and marina owners would be required to bring identified existing substandard/malfunctioning sewage collection systems up to appropriate operating standards. This TMDL will also require all live-aboard vessel owners (including anchor-outs and marina-berthed vessels) to enroll in the Richardson Bay Regional Agencies mobile sewage collection and disposal service.

Approximately every five years after the TMDL adoption, the San Francisco Bay Water Board will review the Richardson Bay Pathogens TMDL and evaluate new and relevant information from monitoring, special studies, and scientific literature as part of an adaptive implementation plan. The San Francisco Bay Water Board will evaluate monitoring results and assess progress toward attaining TMDL targets and load allocations. The San Francisco Bay Water Board will also evaluate compliance through track-able implementation measures from local dischargers and submitted progress reports. If evaluation and monitoring show that source control actions have been fully implemented throughout the watershed, but water quality objectives are not yet obtained, the San Francisco Bay Water Board may re-evaluate the attainability/applicability of the designated water quality objectives. If deemed necessary, any modifications to targets or the implementation plan will be amended into the Basin Plan.

MONITORING

Water Quality monitoring will be conducted to assess water quality improvements and obtain additional information for further refinement of the TMDL as part of the adaptive implementation strategy. The main objectives of the monitoring program are to:

- Assess attainment of TMDL targets
- Evaluate spatial and temporal water quality trends in Richardson Bay
- Obtain additional information about significant potential pathogen sources and areas
- Collect sufficient data to set priorities for implementation efforts and assess the effectiveness of source control actions

ECONOMIC CONSIDERATIONS

A discussion of economic considerations or costs associated with various measures described by the TMDL's implementation plan is limited to those actions that are currently technically feasible and likely to be adopted by dischargers. However, the TMDL is not prescriptive; no specific actions to achieve the numeric targets are required. Rather, dischargers are allowed to independently select implementation actions that will allow them to meet their allocations based on their own considerations of need, budget, feasibility, or other criteria.

This TMDL would not impose any new requirements or actions for sanitary sewer systems; therefore, no additional costs to sanitary sewer collection agencies would be incurred as a result. Stormwater runoff in Richardson Bay is managed by the Marin County Stormwater Pollution Prevention Program. Current development, implementation, and reporting will incur no additional costs. However, some costs may be incurred with new implementation measures including outreach designed to educate local residents about pathogen sources to the watershed. To cover costs of outreach, additional estimated storm water program costs could increase a total of 2 to 10 percent of the existing $100,000 annual budget.

Houseboats and vessels are required to maintain sewage collection systems to ensure compliance with the Richardson Bay vessel discharge prohibition. Additional implementation actions would include an evaluation of the houseboats in Richardson Bay at a cost of approximately $200-$300 per system. Associated repairs could cost from approximately $400-$2,775 per houseboat with collection system failures. Assuming a 10-20 percent failure rate, total cost estimates to all houseboat and marina owners range from $12,000-$222,000.

There are 7 pump-out stations and 1 sewage dump station located in Richardson Bay that are maintained by local municipalities and the Richardson Bay Regional Agency for live-aboard vessels. Estimates for evaluation of these existing sewage collection systems range from $200-$300 per system. Also, a report evaluating the adequacy of the number of available sewage pump-out and dump stations has calculated that 10 additional dump stations and 11 additional pump-out stations are needed. Estimates for installation of a dump station ranges from $500-$10,000 dollars, and installation of a pump-out station ranges from $3,000-$20,000 per unit, depending on conditions. The Basin Plan amendment also requires all live-aboard vessels to enroll in the existing mobile sewage collection service. Most residents have already enrolled. Estimated cost for this service is $6 per month.

Currently, two water quality monitoring programs are being implemented in Richardson Bay: one by the San Francisco Bay Water Board and one by the Richardson Bay Regional Agency. The cost of these existing monitoring efforts is estimated to be between $10,000 and $15,000 annually. The Basin Plan amendment requires Marin County and local stormwater programs to monitor pathogen indicator levels in the receiving waters near the 10-20 stormwater drain outfalls in Richardson Bay in addition to current monitoring. This additional monitoring will be conducted five times per year at an estimated cost of $750-$1,100 per each sampling event ($400 of staff time for each sampling event plus a $35 analytical fee per sampling site) for a total cost of $3,750-$5,500 per year.

POLICY ISSUE

Should the State Water Resources Control Board (State Water Board) approve the amendment to the Basin Plan to establish a TMDL for pathogens in Richardson Bay?

FISCAL IMPACT

San Francisco Bay Water Board and State Water Board staff work associated with or resulting from this action will be addressed with existing and future budgeted resources.

REGIONAL WATER BOARD IMPACT

Yes, approval of this resolution will amend the San Francisco Bay Water Board's Basin Plan.

STAFF RECOMMENDATION

That the State Water Board:

1. Approves the amendment to the Basin Plan adopted under San Francisco Bay Water Board Resolution R2-2008-0061.

2. Authorizes the Executive Director, or designee, to transmit the amendment adopted under San Francisco Bay Water Board Resolution R2-2008-0061 to the Office of Administrative Law and the TMDL to the U.S. Environmental Protection Agency for approval.

State Water Board action on this item will assist the Water Boards in reaching Goal 1 of the Strategic Plan Update: 2008-2012 to implement strategies to fully support the beneficial uses for all 2006-listed water bodies by 2030. In particular, approval of this item will assist in fulfilling Action 1 to prepare, adopt, and take steps to carry out Total Maximum Daily Loads (TMDLs), designed to meet water quality standards, for all impaired water bodies on the 2006 list.

D R A F T

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2009-

APPROVING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN FRANCISCO BAY REGION (BASIN PLAN) TO ESTABLISH A TOTAL MAXIMUM DAILY LOAD (TMDL) AND IMPLEMENTATION PLAN FOR PATHOGENS IN RICHARDSON BAY

WHEREAS:

1. On July 9, 2008, the San Francisco Bay Regional Water Quality Control Board adopted Resolution R2-2008-0061 amending the Basin Plan to establish a TMDL for pathogens in Richardson Bay.

2. The amendment meets the necessity standard of the Administrative Procedures Act, Government Code section 11353, subdivision (b).

3. The San Francisco Bay Water Board staff found that the adoption of this amendment would be consistent with the State Antidegradation Policy (State Water Board Resolution No. 68-16) and federal antidegradation requirements (40 Code of Federal Regulations (CFR) 131.6).

4. The San Francisco Bay Water Board found that the analysis contained in the TMDL staff report, the California Environmental Quality Act (CEQA) Checklist, and the responses to public and peer review comments comply with the requirements of the State Water Resources Control Board's (State Water Board's) certified regulatory CEQA process, as set forth in California Code of Regulations title 23, section 3775 et seq.

5. The State Water Board finds that the Basin Plan amendment is in conformance with Water Code sections 13240 and 13242, which specify that Regional Water Quality Control Boards may revise Basin Plans and implement programs for achieving water quality objectives. The State Water Board also finds that the TMDL is consistent with the requirements of federal Clean Water Act section 303(d).

6. The TMDL establishes a numeric target of a five sample per month median fecal coliform density of <14 organisms /100 milliliters (mL), with no more than 10 percent of water samples exceeding 43 organisms/100 mL in a 30-day period.

7. The TMDL will be implemented via an adaptive strategy that will use monitoring data collected and relevant scientific information to determine the progress towards meeting the associated targets and allocations. The San Francisco Bay Water Board will evaluate new and relevant information after five years of the effective date of the TMDL; any necessary modifications to the targets, allocations, or implementation plan will be incorporated into the Basin Plan.

8. The Basin Plan amendment does not become effective until approved by the State Water Board and until the regulatory provisions are approved by the Office of Administrative Law (OAL). The TMDL must also be approved by the U.S. Environmental Protection Agency (U.S. EPA).

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. Approves the amendment to the Basin Plan adopted under San Francisco Bay Water Board Resolution R2-2008-0061.

2. Authorizes the Executive Director, or designee, to transmit the amendment adopted under San Francisco Bay Water Board Resolution R2-2008-0061 to OAL and the TMDL to U.S. EPA for approval.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on (TBD).

Jeanine Townsend
Clerk to the Board