

STATE WATER RESOURCES CONTROL BOARD
WORKSHOP SESSION--DIVISION OF WATER QUALITY
OCTOBER 5, 2005

ITEM 3

SUBJECT

INFORMATION ITEM- [STATUS REPORT](#) ON THE STATE WATER RESOURCES CONTROL BOARD (STATE WATER BOARD) PROGRAM TO DEVELOP A RAPID DIAGNOSTIC TEST FOR MEASURING BACTERIA INDICATORS IN COASTAL WATERS

DISCUSSION

A 1995 Santa Monica Bay epidemiological study found a correlation between increased incidences of gastrointestinal illnesses and increased levels of bacterial indicator organisms in storm drain runoff. A direct result of this study was the passage of Assembly Bill (AB) 411 (Chapter 765, Statutes of 1997), increasing the monitoring required for heavily used ocean beaches. AB 639 (Chapter 502, Statutes of 2001) required the State Water Board, in conjunction with the Department of Health Services, to develop reliable, rapid, and affordable diagnostic tests for indicator organisms on or before July 1, 2003.

Conventional culture-based (U.S. Environmental Protection Agency [USEPA] approved) methods currently used to evaluate bacterial contamination of recreational waters require an 18 to 24 hour incubation period. Recently published data show that temporal changes in indicator bacteria levels in beach water occur much more rapidly than the minimum 18 to 24 hour test period. This lag time means that beach waters with bacterial levels exceeding water quality standards on the day the sample is collected are not posted or closed until at least the following day. This time lag also inhibits tracking of contamination sources, since the signal can dissipate before upstream tracking is initiated. A more rapid analytical method is needed that can be completed on the same day. Therefore, a major element of the State Water Board's Clean Beaches Initiative is the development of a rapid test for indicators of microbial contamination.

As part of the Fiscal Year 2001-02 budget, \$1.5 million was allocated to fund the development of rapid analytical methods for bacterial indicator organisms in coastal waters. In 2002, the State Water Board contracted with the Southern California Coastal Water Research Project (SCCWRP) to conduct this project. SCCWRP organized a workshop on initiating the development of rapid indicators method(s) on May 14-16, 2003 in Monterey. SCCWRP prepared and distributed a Request for Proposals (RFP) to solicit proposals from researchers throughout the United States. Nine proposals were submitted. SCCWRP convened a technical advisory committee to review the proposals. Five proposals were selected and funded. The State Water Board reported on the status of the rapid indicators test development to the Legislature at the end of the contract in 2003 (*Report to the Legislature, July 2003*). SCCWRP continued the testing and evaluation after the contract ended and available funding was expended. State Water Board staff continued to participate in this effort and continue to work with SCCWRP in the development of the rapid indicators.

Several rapid methods demonstrated in 2003, after a year of method development, became sufficiently mature to undergo evaluative testing to assess whether they are suitable replacements for conventional methods. SCCWRP designed a study and conducted evaluations of the new rapid methods on June 2-4, 2004. The study was designed to demonstrate the new methods and compare them with the conventional culture-based methods. While none of the new rapid methods produced results equivalent to those of the reference laboratories using conventional methods, several did perform sufficiently to indicate that they could be improved.

SCCWRP recently held another evaluation on June 21-23, 2005. Seven organizations employing five classes of methods participated. Initial results are very promising. SCCWRP is now performing the data evaluation for this most recent round of testing, focusing on the accuracy, sensitivity, precision, and robustness of the rapid methods. One important consideration is that some of the new methods measure molecular material (e.g., DNA) and may not always produce results equivalent to that of conventional methods, which quantify only live bacteria.

After the results of the 2005 Study are evaluated this fall, the appropriate rapid method(s) will need to be refined further, assessed and validated. This should include additional beach water quality testing (including other matrices not already tested such as other marine/estuarine beaches in central and northern California, and fresh water beaches). These new rapid methods must then be certified for use in ambient waters, and the technology will need to be shared and transferred to those who will be using the new methods. This is a critical step in implementing an effective and efficient rapid detection approach for beach monitoring statewide.

Since the end of the original contract, SCCWRP has continued working on this project without dedicated State funding. During this period, SCCWRP has estimated spending over \$300,000. Significant funding (approximately \$2,000,000) has also been contributed by a combination of USEPA and private companies. These private investments were generated largely as a result of the rigorous scientific evaluation process developed by SCCWRP, the involvement in the process by the State Water Board, and the ultimate process for certification of the successful methods by the State.

This project has been extremely successful to date. It is now not only timely, but it is also essential to complete this project for the protection of public health and the advancement of beach water quality science. Complete development, certification, and implementation of the new rapid methods will require concerted State Water Board staff involvement and additional State funding. It is estimated that about \$1 to \$2 million will be required for SCCWRP to complete his work. Staff recommends that this funding be made a priority in the Prop 50 Coastal Nonpoint Source Pollution Control Grant Program.

Detailed information on rapid indicators may be found in the attached report, *Progress Report: Development of Rapid Methods for Bacterial Indicators in Coastal Waters*, Azimi-Gaylon, S. and Gregorio, D. September 2005.