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STAFF REPORT TITLED, "2011 UPDATE: BALLAST WATER TREATMENT SYSTEMS FOR USE IN CALIFORNIA WATERS"

The Coastal Ecosystems Protection Act of 2006 (Act) expanded the Marine Invasive Species Program to more effectively address the threat of nonindigenous species introductions through ballast water discharge. The Act required the California State Lands Commission (Commission) to implement performance standards for the discharge of ballast water and to prepare reports assessing the efficacy, availability and environmental impacts, including water quality, of currently available ballast water treatment technologies eighteen months in advance of each of the individual implementation dates. The performance standards regulations were adopted in October 2007, and subsequent legislatively-mandated ballast water treatment technology assessment reports were approved by the Commission in December 2007 (see Dobroski et al. 2007), December 2008 (see Dobroski et al. 2009), and August 2010 (see California State Lands Commission 2010). This current update (Exhibit A) was requested by the Commission by September 1, 2011, and serves as a follow-up to the August 2010 legislatively-mandated report to ensure that technologies are developing on schedule to allow for the implementation of California's performance standards for vessels with a ballast water capacity of greater than 5000 metric tons (MT) for which construction begins on or after January 1, 2012.

Commission staff reviewed 60 ballast water treatment systems for this update. Because of the limitations of testing data and the variable conditions present in the "real world," this update examines treatment system performance data to determine whether or not systems have demonstrated the **potential** to comply with California's standards. Based on currently available information and using best assessment techniques, 10

treatment systems have demonstrated the potential to comply with the Commission's performance standards (see Table 4 in Exhibit A) – an increase of two since the 2010 report and an increase of eight since 2009. Efficacy data for these systems indicate that at least one test (averaged across replicates) met California's standards for every testable organism size class during either land-based or shipboard testing. Five of the 10 systems show the potential to meet California standards more than 50% of the time over multiple tests (3 or more) during either land-based or shipboard testing. One system demonstrated potential compliance with California's standards 100% of the time in shipboard testing, although no system has yet met California's standards 100% of the time in land-based testing. This review does not constitute an endorsement or approval of any treatment system, system manufacturer or vendor by the Commission or its staff.

Since the August 2010 technology assessment report, there has been significant activity concerning performance standards implementation and ballast water technology assessment at the state, federal and international levels. Recent reports from the Great Lakes Ballast Water Collaborative (GLBWC 2010), Wisconsin Department of Natural Resources (WDNR 2010), and the U.S. Environmental Protection Agency (EPA) Science Advisory Board (SAB 2011) have concluded that the current limits of testing methods prevent evaluating, with a high level of statistical sensitivity, whether or not treatment systems can meet standards more stringent than the International Maritime Organization (IMO), particularly for the greater than 50 micrometer (one millionth of a meter, µm) organism size class (see Table 1 in Exhibit A). California's standards were not specifically reviewed in these reports. California's discharge standard for organisms greater than 50 µm is "no detectable living organisms," and is not defined by a specific volumetric concentration. Thus, California's standard for this organism size class is not directly comparable to the IMO or standards proposed by other entities evaluated by these reports.

It is important to note that, as a whole, treatment systems have undergone a relatively small number of tests, under a limited range of environmental conditions. This leads to inherent uncertainty regarding treatment system performance across the spectrum of potential variables, including ship type and source water properties (e.g. temperature, turbidity, salinity). This uncertainty is likely to persist over the next several years. In the absence of a significant worldwide effort to install and test treatment systems on multiple vessels and under all possible environmental scenarios, it is unreasonable to expect that sample sizes and available data will increase adequately in the near future to demonstrate, with a high level of confidence, that treatment systems will consistently meet California's performance standards under every potential situation and under all circumstances. However, continuing to wait for such information will only serve to delay progress. Due to the inherent uncertainty regarding treatment system performance and evaluation, the utilization of an adaptive management approach will be essential at all stages of implementation in order to move forward and protect California's aquatic resources from the impacts of species introductions.

Because of the difficulties of testing treatment technologies to meet California's standards with a high level of statistical confidence, staff convened the ballast water treatment technology technical advisory panel (established by Public Resources Code (PRC) Section 71204.9) in December 2010 and March 2011 to discuss options for implementing California's performance standards for the discharge of ballast water. The panel discussed three options including: 1) recommending that the Legislature amend the standards, 2) recommending that the Legislature implement the use of Best Available Technologies until such time that staff can statistically verify that treatment system meet the standards, or 3) develop and adopt regulations defining specific protocols to verify vessel compliance with California's performance standards. The panel agreed that the best option for moving forward was to develop and adopt compliance verification protocols. These protocols will allow system manufacturers and vessel owners/operators to verify that their treatment technologies are meeting California standards using the same methods, and with the same statistical sensitivities, that will be used by Commission personnel to determine compliance. Commission staff has convened a panel of experts to develop the compliance protocols and intends to begin the rulemaking process in late-2011.

In conclusion, Staff continues to see great progress in the development and testing of ballast water treatment technologies. While there are some challenges verifying that treatment systems meet California's standards with high levels of statistical certainty, Commission staff have worked with a technical advisory panel of regulators, industry members, scientists and environmental organizations to discuss options for proceeding with the implementation of California's standards. Based on those discussions, Commission staff is in the process of developing verification protocols to ensure that all vessels discharges are compliant with California law. Staff recommends that the Commission continue to support staff's effort to implement California's performance standards for the discharge of ballast water. These efforts will continue to move the state towards the elimination of the discharge of nonindigenous species into California waters.

EXHIBIT:

A. "2011 Update: Ballast Water Treatment Systems for Use in California Waters"