59

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From: Ross, Lauren (SD)
Sent: Friday, March 27, 2009 12:19 PM
To: 'CHagan@waterboards.ca.gov'; 'PWyels@waterboards.ca.gov'
Cc: 'Peter MacLaggan'; Garrett, Christopher (SD); Singarella, Paul (OC)
Subject: Poseidon Revised Minimization Plan - Draft of Attachment 10

Attachments: 3_27_09 Min Plan Att 10.pdf

Ms. Hagan and Mr. Wyels -

In advance of Poseidon's submission of the revised Minimization Plan and corresponding documents this afternoon, we wanted to send you this draft of Attachment 10, which represents the explanation of the modification of the entrainment minimization technology measures previously discussed.

Please let us know if you have any comments or thoughts. Please note that we are not asking for the Board's approval on this document, we simply want to confirm that this is an appropriate submittal by Poseidon and corresponds with what you were anticipating for this document.

We will be sending you all final documents at 2 pm.

Best regards,

Lauren Ross

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3_27_09 Min Plan Att 10.pdf (2...

ATTACHMENT

CARLSBAD SEAWATER DESALINATION PROJECT

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

REGION 9, SAN DIEGO REGION

ORDER NO. R-9-2006-0065

NPDES NO. CA0109223

FLOW, ENTRAINMENT AND IMPINGEMENT MINIMIZATION PLAN

ATTACHMENT 10 – EXPLANATION OF MODIFICATION TO ENTRAINMENT MINIMIZATION TECHNOLOGY MEASURES

March 27, 2009

EXPLANATION OF MODIFICATION TO ENTRAINMENT MINIMIZATION TECHNOLOGY MEASURES

The San Diego Regional Water Quality Control Board ("Regional Board") will consider the Flow, Entrainment and Impingement Minimization Plan ("Plan") for the Carlsbad desalination Project ("CDP" or "Project") at its April 8, 2009 meeting. The Plan was required as a Special Provision of the Project's NPDES permit in order to assure compliance with the Porter-Cologne Water Quality Control Act, Water Code Section 13142.5(b), which requires industrial facilities using seawater for processing to use the best available site, design, technology, and mitigation feasible to minimize impacts and mortality to marine life.

This memorandum explains the reasoning for the modification to the entrainment minimization technology measures as reflected in Chapter 4, Technology, of the Plan. Based on updated research and input from the California Coastal Commission and the Commission's Scientific Advisory Panel ("SAP") [1], Poseidon has discovered that the installation of micro screens ahead of seawater pretreatment facilities and the use of a low pressure membrane pretreatment system would not be effective in returning viable organisms to the ocean, and would not result in any minimization or reduction of entrainment. Accordingly, the Plan was modified to remove these technology measures from the Plan.

I. POSEIDON ELIMINATED TECHNOLOGY MEASURES FOLLOWING FINDING BY THE COASTAL COMMISSION THAT SUCH MEASURES WOULD BE INEFFECTIVE IN REDUCING ENTRAINMENT AND IMPINGEMENT IMPACTS

In the April 2008 version of the Plan previously submitted to the Regional Board, Poseidon proposed the installation of micro screens and the use of a low pressure membrane pretreatment system to increase the potential to capture marine organisms and to successfully return them to the ocean. Based upon the use of these proposed technology measures, Poseidon initially considered the mortality rate of the entrained marine organisms to be less than 100%.

Subsequent to that proposal, however, Poseidon, with the assistance of the Coastal Commission and the SAP, discovered that these technology measures would not be effective in returning viable organisms to the ocean, and would not result in any minimization or reduction of entrainment. The SAP observed that the protocols used in the Project's entrainment studies included an assumption of 100% mortality based on guidance from the U.S. EPA and reflecting

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[1] **SAP** is a team of independent scientists that provides guidance and oversight to the Commission on ecological issues associated with the San Dieguito Restoration Project. That Project is being implemented by Southern California Edison pursuant to requirements of coastal development permits issued by the Commission and is meant to mitigate for marine resources losses caused by the San Onofre Nuclear Generating Station (SONGS). The Marine Review Committee **SAP currently** consists of ***Dr. Richard Ambrose***, Professor and Director of Environmental Science & Engineering Program, Department of Environmental Health Sciences, University of California Los Angeles; ***Dr. John Dixon***, Senior Ecologist, California Coastal Commission; ***Dr. Mark Page***, Marine Science Institute, University of California at Santa Barbara; ***Dr. Pete Raimondi***, Professor and Chair of Ecology and Evolutionary Biology, University of California at Santa Cruz; ***Dr. Dan Reed***, Marine Science Institute, University of California at Santa Barbara; ***Dr. Steve Schroeter***, Marine Science Institute, University of California at Santa Barbara; and, ***Dr. Russ Schmitt***, Director of Coastal Research Center, University of California at Santa Barbara.

the practice of California's State and Regional Water Boards, the California Energy Commission, and the Coastal Commission in conducting and evaluating these studies.[2] The Commission applied this assumption to the Project after consideration of the micro screen and pretreatment system technology measures proposed in the April 2008 version of the Plan. The basis for the Commission's decision not to grant any mitigation credit for these technology measures was the lack of peer-reviewed scientific studies that support using a lower mortality rate for different types of desalination systems that cause entrainment.[3]

In the case of Poseidon's proposed screening and pretreatment technology measures, the Commission found that the entrained organisms will be subject to a number of stressors – including high pressures, significant changes in salinity, possible high temperature differences if the power plant is operating, etc. – and they will then be discharged to a different environment than is found in Agua Hedionda.[4] From this, the Commission concluded that any one or a combination of these stressors could result in mortality of the marine organisms prior to the return to the ocean.[5]

In addition, the long-term survival of marine organisms once they have been returned to the ocean is also uncertain. Researchers have observed that predators will often wait at the area where the marine organisms are returned, having associated it with the regular release of "dazed fish that make for an easy meal."[6] Thus, it is uncertain whether the returned marine organisms survive past the initial release into the ocean or thereafter contribute reproductively to the population.[7]

Therefore, Poseidon determined that these technology measures would not be effective in the minimization or reduction of entrainment, and the decision was made to remove these technology measures from the Plan.

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[2] California Coastal Commission. *Recommended Revised Condition Compliance Findings, Marine Life Mitigation Plan for Coastal Development Permit E-06-013, Poseidon Resources Carlsbad Desalination Project*, November 21, 2008, at 13. Available at http://documents.coastal.ca.gov/reports/2008/12/W16a-12-2008.pdf;
[3] *Id.*
[4] *Id.*
[5] *Id.*
[6] Ferry-Graham, Dorin, and Lin, *Understanding Entrainment at Coastal Power Plants: Informing a Program to Study Impacts and Their Reduction*, CEC-500-2007-120 at 36 (March 2008).
[7] *Id.*