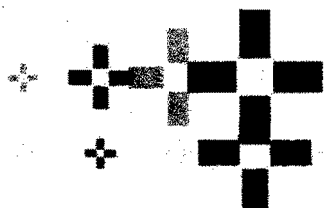


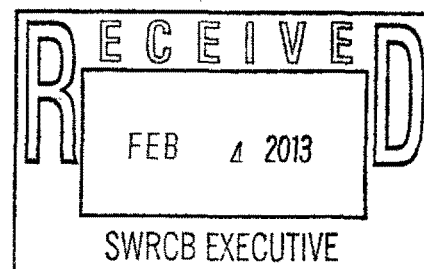
 nrg

**Cabrillo Power I, LLC.**  
4600 Carlsbad Boulevard  
Carlsbad, CA 92008  
Phone: 760.268.4000  
Fax: 760.268.4026

JB

January 30, 2013

Mr. Thomas Howard  
Executive Director  
State Water Resources Board  
Division of Water Quality, 15<sup>th</sup> Floor  
1001 I Street  
Sacramento, CA 95814



**RE: ONCE-THROUGH COOLING POLICY IMPLEMENTATION PLAN  
UPDATE FOR ENCINA POWER STATION; Letter dated December 11,  
2012**

Dear Mr. Howard,

Cabrillo Power I LLC (Cabrillo), owner and operator of the Encina Power Station (EPS), submits its response to the State Water Resources Control Board's (State Water Board) December 11, 2012 letter in which the SWRCB requested an update to Cabrillo's Implementation Plan to meet the Statewide Water Quality Control Board Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (OTC Policy). EPS is located at 4600 Carlsbad Boulevard in Carlsbad, CA and consists of 5 steam boiler units (Units 1-5) with a combined capacity of approximately 939 megawatts (MW) and one approximately 15 MW peaking unit with black start capability.

The State Water Board's OTC Policy was adopted on May 4, 2010 and became effective on October 1, 2010. On November 30, 2010, the State Water Board sent a letter pursuant to Water Code Section 13383 directing Cabrillo to submit an Implementation Plan (IP) addressing a list of specified information requirements. Cabrillo submitted its IP on March 30, 2011. In the IP, EPS outlined the planned Track 1 compliance for Units 1, 2, and 3 through the replacement of the associated generation with the Carlsbad Energy Center Project (CECP), a California Energy Commission (CEC) licensed project located on the EPS site. Cabrillo filed its Application for Certification with the CEC and the corresponding air permit application in October 2007. CECP is a 550-MW air-cooled, combined cycle natural gas-fired power plant consisting of two independent power trains. Each train includes one Siemens SCC6-5000F combustion gas turbine generator with

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evaporative inlet air cooling and steam injection power augmentation (PAG) systems, one single pressure, fast start, heat recovery steam generator (HRSG), and one condensing steam turbine generator, arranged in a one-on-one combined cycle configuration.

Based on a demonstration that Track 1 compliance would not be feasible for Units 4 and 5, the IP proposed a Track 2 compliance schedule for Units 4 and 5 to meet the December 31, 2017 compliance deadline established in the OTC Policy.

In a letter dated December 11, 2012, the State Water Board requested responses to five questions relating to the objectives and schedule for Cabrillo to meet the OTC Policy for EPS Units 1-5. The questions are restated or paraphrased below, with responses following:

1. A schedule for the reporting of Units 1, 2, and 3. In addition, address requirements 3, 4, 5 and 6 in the State Water Board letter of November 30, 2010.
2. There was no indication that a Power Purchase Agreement (PPA) with a utility or other load serving entity is needed prior to pursuing Track 1 for Units 1, 2, and 3 or for Track 2 for Units 4 and 5. Please confirm NRG's intention to complete the repowering of Units 1, 2 and 3 and to pursue Track 2 compliance for Units 4 and 5 regardless of PPA status. Please address NRG's plans with and without the return of service of SONGS.
3. The status of any necessary permitting activities to repower or retrofit your generating facilities.
4. The required study design for both impingement and entrainment studies for Track 2 compliance for Units 4 and 5.
5. Information on the effectiveness of implementing water intake flow reductions, a comparison on present and historical water intake flow, and the MW production, as these data correspond to the requirements of OTC Policy Section 2(C)(2).

1. Units 1-3 Repowering and Permitting Status

Cabrillo continues to pursue Track 1 compliance for Units 1, 2, and 3. Track 1 compliance for Units 1-3 has progressed since Cabrillo filed its IP in March 2011. On May 31, 2012, the CEC approved a license for the CECP (Docket 07-AFC-06)(Decision). In their Decision, the Commission cited the importance of CECP and EPS in general, from its generation characteristics – fast start, air-cooled with combined cycle efficiency, and the locational value in serving both the San Diego Local Capacity Region (LCR) and south Orange

County region, which rely on the approximately 2200 MWs of base-load generation and associated reactive power support from the San Onofre Nuclear Generating Station (SONGS) to maintain the reliability of the bulk electric system in that area. The CEC's Decision was appealed by the City of Carlsbad and community intervenor groups, both through a Petition for Reconsideration to the CEC and through two appeals to the State Supreme Court. The CEC denied the Petition for Reconsideration on July 24, 2012. The State Supreme Court denied the appeals of the CEC Decision and the denial of the Petition for Reconsideration on October 31, 2012. The CEC Decision is thus non-appealable.

The CEC's May 31, 2012 Decision approving the CECP license enabled the San Diego Air Pollution Control District (SDAPCD) to issue the Authority to Construct (ATC); the ATC was issued on June 25, 2012. Emission reduction credits have been secured to meet the necessary NOx offsets specified in SDAPCD's Final Determination of Compliance/Authority to Construct. EPA approval to start construction is still needed through either a determination that Prevention of Significant Deterioration (PSD) is not triggered for criteria pollutants and Greenhouse Gases (GHG), or a PSD permit is obtained for pollutants that may trigger PSD. A current applicability determination or PSD permit has not been issued from EPA or SDAPCD to date. The CECP also intends to obtain a National Pollutant Discharge Elimination System (NPDES) permit for the discharge of wastewater associated with the planned 4.3 million gallon per day (MGD) ocean water purification system, which will provide industrial water for CECP.

## 2. PPA Status and Estimated Schedule for Site Mobilization and Construction of CECP

Construction of the CECP is contingent upon successful financing, which in turn depends upon obtaining a PPA. Without the net revenue certainty provided by a PPA, construction of the CECP would not be economically feasible. Accordingly, if the CECP cannot obtain a PPA and cannot obtain financing, then Cabrillo would expect to retire Units 1, 2 and 3 by December 31, 2017.

The California Public Utilities Commission (CPUC) continues work on projecting future needs for new natural gas-fired resources. Authorization by the CPUC to procure new generation could occur in Track 2 (not to be confused with Track 2 as that term is used in the OTC Policy) of the current Long-Term Procurement Plan (LTPP) rulemaking later this year, or such authorization, if it occurs, may not occur until the next LTPP. Without the requisite procurement authorization from the CPUC, it is very unlikely that Cabrillo could obtain the PPA necessary to pursue the CECP project. The 2012-13 Long Term Procurement Plan forecasts for the San Diego LCR and south Orange County has undergone several revisions as CAISO and the

load serving entities plan around the status of SONGS, which continues on its outage. While Cabrillo is not in a position to opine about the future of SONGS, Cabrillo continues to follow the procurement process closely and is prepared to submit CECP in response to future Request for Offers in order to obtain a PPA that would enable the construction of the CECP to go forward. Cabrillo has filed the necessary updates to its Large Generator Interconnection Agreement (LGIA) and remains in the transmission planning queue.

The CECP Decision had estimated a Commercial Online Date (COD) for the summer of 2016 based on the following schedule milestones.

- Commence Conditions of Certification Compliance and Monthly Compliance Reporting – January 2013
- Site Mobilization – July 2013
- Site Preparation and Fuel Oil Tank Demolition – July 2013 to June 2014
- Additional Permitting (PSD) – March 2013 to June 2014
- Construction – June 2014 to June 2016
- Retirement and Elimination of OTC for Unit(s) 1-3 – Summer 2016

The schedule presumes successful negotiation and execution of a PPA with a credit-worthy load-serving entity, successful financing of CECP, and timely issuance of remaining permits that support construction and/or operation of CECP. Site mobilization, including site preparation and demolition of existing fuel oil tanks within the planned footprint of CECP, will require CEC approval before commencing. Compliance filings to satisfy site mobilization are in progress with the objective of meeting the pre-construction activities. Depending on the status and outcome of the LTPP process, it is possible that the CECP COD could be delayed until 2017 and potentially beyond. If the CECP COD is later than December 31, 2017, and the CAISO determines that continued operation of Units 1, 2 and 3 is necessary to maintain electric reliability, then Cabrillo may request an extension of the December 31, 2017 compliance deadline.

The importance of the CECP as replacement of aging steam boiler generation that relies on ocean water for cooling purposes was evident during the CEC licensing process. Furthermore, the characteristics of CECP – fast start and ramping with air-cooled combined cycle efficiency, are ideal for integrating the increasing number of renewable energy resources. With the uncertainty regarding the status of SONGS that began in January 2012, the locational value of generation from EPS and CECP continues to be discussed in the CAISO's planning and CPUC's procurement processes.

3. Details of New Generating Units, Power Generation During Construction, and Transmission Configuration (Items 4, 5 and 6 in November 30, 2010 Letter)

The CECP consists of two generation trains, with each train including one 67 MW steam turbine generator (STG) rated 76.8 MVA, 13.8-kV and one 208 MW combustion turbine generator (CTG) rated 244 MVA, 16.5-kV. The project as planned includes a new 138-kV switchyard and a new 230-kV switchyard at the CECP site.

The proposed schedule for CECP allows for Units 1, 2, and 3, with a cumulative output of 321-MW, to operate up to the COD of the CECP resulting in no periods of time where either grouping of units would not be available to generate electricity to support system reliability.

The new 138-kV and 230-kV switchyard outlet lines will interconnect, respectively, to San Diego Gas & Electric's (SDG&E) existing 138-kV switchyard on the EPS site and to a new East Encina 230-kV switchyard, east of SDG&E's existing Encina 230-kV switchyard.

4. Units 4 and 5 Status and Entrainment and Impingement Studies

Cabrillo no longer intends to pursue Track 2 compliance for Units 4 and 5. Instead, Cabrillo anticipates operating Units 4 and 5 in their current configuration until the OTC Policy compliance date of December 31, 2017, and then retiring the units. Since the filing of the IP, Cabrillo has conducted further analysis of potential Track 2 compliance options to meet the Impingement Mortality and Entrainment reduction requirements in the OTC Policy. Cabrillo has determined that the implementation of technological and/or operational controls to achieve the requisite reductions at Units 4 and 5, while technologically and logistically feasible, may not be economical without a multi-year PPA that accounts for the capital expenditure and potential reduction in plant efficiency. Retirement of these units will result in the elimination of 633 MGD of Design OTC Flow (307 MGD at Unit 4 and 326 MGD at Unit 5).

Cabrillo continues to maintain that prior entrainment and impingement studies accurately reflect current impacts, consistent with OTC Policy Sections 4(A)(1) and 4(B)(1), but with the decision to retire Units 4 and 5, OTC Policy Section 4 is now inapplicable, and the existing entrainment and impingement data are not relevant to achieving compliance.

## 5. Future Use of OTC Intake and Discharge Conduits

EPS' intake structure and discharge conduits will be shared by the Poseidon's Carlsbad Desalination Plant in accordance with their NPDES Permit when the plant is operational. The Poseidon Desalination facility has recently received licensing approval, contractual water delivery agreements, and financing to allow for the start of construction. Poseidon anticipates the desalination facility to begin to deliver potable water during 2016. The desalination process is permitted to withdraw 304-MGD of ocean water to produce 50-MGD of potable water. Use of the intake structure and discharge conduits by Poseidon following the retirement of Units 1-3 through Track 1 compliance and after the retirement of Units 4 and 5 by December 31, 2017 is addressed in Poseidon's Carlsbad Desalination Project NPDES permit.

## 6. Water Intake Flow Reductions

EPS does not run cooling water pumps without a specific electrical generation or critical system requirement, This position is consistent with the objectives of OTC Policy § 2.C.(2), which requires an existing power plant unit that is subject to the OTC Policy to cease intake flows when not engaging in power-generating activities, or critical system maintenance, unless a reduced minimum flow is necessary for operations, and is consistent with Cabrillo's objective of reducing the large auxiliary electricity demand for the pump motors and associated costs.

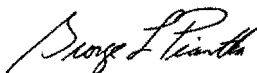
EPS water intake requirements are directly related to the dispatch of either or all of Units 1-5 through California Independent System Operator (CAISO) and/or the load serving entity dispatch instructions. The annual average flow for EPS is between 500 and 600 MGD with peaks of 800 MGD in the winter and summer months. While there was a drop in the average from 2006 to 2010, the average flow has returned to historical values since 2011. The flow has also increased since the SONGS outage in January 2012. EPS cooling water flow rate does not vary linearly with MW generation. For example, two cooling water pumps are running for Units 1-3 whether they are producing 20 MW or 100 MW on a particular unit, corresponding to minimum and maximum load. Units 4 and 5 have the ability to operate only one cooling water pump per unit while producing MW within the minimum to maximum load range (20 MW to 300 MW) per unit. However, the operation of two cooling water pumps is often required due to ambient ocean water temperature and tidal cycles. Depending on the dispatch instructions, the respective units are expected to ramp up or down from minimum load to maximum load. The intake cooling water system as currently configured must continue at its respective flow rates per unit when the units are operating, in particular as the cooling system responds to changing levels of generation (i.e., "ramping"). As a result, comparing of OTC flow rates to generation does not yield a pattern to assess the reduction of OTC flow corresponding to a reduction of MW's produced over time. In addition, OTC

circulating pumps are used for plant critical system maintenance needs including but not limited to the following:

- Maintaining condenser vacuum pressure after unit shut-down to prevent overheating the steam turbine;
- Maintaining lube oil temperature for the steam turbine and auxiliary equipment to prevent overheating;
- Maintenance chlorination sequences to limit component bio-fouling when the station has not had cooling water flow for an extended period of time; and Heat treatments and other maintenance activities resulting in non-generating unit pump(s) operating.

I anticipate the above information has addressed the State Water Board's questions regarding Cabrillo's Implementation Plan. If you have any questions or comments, please do not hesitate to me at [george.piantka@nrgenergy.com](mailto:george.piantka@nrgenergy.com) or (760) 710-2156.

Sincerely,



George L. Piantka, PE  
Director of Environmental Business  
NRG Energy, West Region  
As agent for Cabrillo Power I LLC

cc: Jonathan Bishop, Chief Deputy Director, SWRCB  
Dr. Maria de la Paz Carpio-Obseso, Chief of Ocean Unit, SWRCB  
Jerry Carter, Plant Manager, Cabrillo Power I LLC/Encina Power Station  
Peter Landreth, NRG West Region  
Tim Sisk, NRG West Region