DYNEGY

DYNEGY MOSS LANDING, LLC
Moss Landing Power Plant
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DIVISION OF WATER QUALITY

February 28, 2017

Michael A.M. Lauffer, Chief Counsel
State Water Resources Control Board
1001 I Street, 22nd Floor
Sacramento, CA 95814-2828

Philip Isorena
Chief of the NPDES Unit
State Water Resources Control Board
Division of Water Quality, 15th Floor
1001 I Street
Sacramento, CA 95814

Re: Annual Update for 2016 Pursuant to Settlement Agreement between SWRCB and Dynegy regarding Once-Through Cooling Water Policy and Submittal of Revised Implementation Plan

Dear Messrs. Lauffer and Isorena:

Dynegy Moss Landing, LLC (Dynegy Moss Landing) submits this annual update for calendar year 2016 pursuant to paragraphs 2.1.6.c and 2.1.7.e of the Settlement Agreement and Release Regarding Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling Between State Water Resources Control Board (SWRCB) and Dynegy (Settlement Agreement), as executed on October 9, 2014. Also enclosed is an updated Implementation Plan (Revised February 2017) for the Moss Landing Power Plant (MLPP), which includes (i) changes to reflect the retirement of MLPP Units 6 and 7 on December 31, 2016, (ii) updated plans regarding supplemental control technology for Units 1 and 2, and (iii) other miscellaneous updates.[1]

Paragraph 2.1.7.e of the Settlement Agreement provides that Dynegy Moss Landing will provide the SWRCB with updates annually, as described in paragraph 2.1.6.c, on its implementation of the Policy. Paragraph 2.1.6.c of the Settlement Agreement, in turn, specifies that, starting in 2015, by March 1 of each year, Dynegy Moss Landing will provide the SWRCB with an annual update on the status of (1) operational or other supplemental measures undertaken in the previous calendar year to reduce entrainment or impingement mortality, and (2) any studies undertaken in the previous calendar year to determine compliance options to meet Track 2 requirements.

[1] The updated Implementation Plan is submitted in follow-up to Dynegy Moss Landing's January 5, 2017 response letter to the SWRCB's November 7, 2016 request for information regarding MLPP as pertaining to the OTC Policy.

In March 2015, Dynegy Moss Landing started entrainment and impingement sampling at the MLPP in accordance with the proposed Monitoring Plan for Impingement Mortality and Entrainment (Dec. 10, 2014) as was submitted to the SWRCB. See Table 1 for all sampling dates in 2016. No results are available at this date. The two years of impingement and entrainment sampling are scheduled to conclude on March 23, 2017.

Table 1-1. Summary table showing the number of impingement and entrainment samples collected, by survey, in 2016. Each Survey represents a 24 hour sampling period beginning close to midday on the start date shown in the table and ending close to midday on the following day. Four consecutive impingement samples are collected each survey on a 6 hour cycle from both intake locations (Units 1&2 and Units 6&7). Impingement samples are only collected when the corresponding units are operating on the day of the pre-scheduled survey. Six consecutive entrainment samples are collected each survey on a 4 hour cycle from both intake
locations. Entrainment samples are always collected at both intake locations, whether or not the intakes are operating on the day of the pre-scheduled survey. In addition, a single meroplankton sample was collected once per month using a finer mesh net. The surveys are pre-scheduled on a weekly basis from November through June and every second week from July through October. Table rows are shaded by month.

Table 1. Impingement and Entrainment Sampling Dates in 2016					
Dynegy Moss Landing, LLC					
Survey Start Date	Impingement		Entrainment		
	1&2	6&7	1&2	6&7	
1/5/2016	-	-	6	6	Weekly Entrainment
1/11/2016	4	-	6	6	
1/19/2016	-	-	6	6	
1/26/2016	4	-	6	6	
2/3/2016	-	-	6	6	
2/9/2016	4	-	6	6	
2/16/2016	-	-	6	6	
2/23/2016	4	-	6	6	
3/3/2016	-	-	6	6	
3/8/2016	4	-	6	6	
3/17/2016	-	-	6	6	
03/23/16[1]	-	-	6	6	
3/30/2016	4	-	6	6	
4/6/2016	-	-	6	6	
4/12/2016	4	-	6	6	
4/20/2016	-	-	6	6	
4/27/2016	4	-	6	6	
5/3/2016	-	-	6	6	
5/11/2016	4	-	6	6	
5/18/2016	-	-	6	6	
05/25/16[2]	-	-	6	6	
6/1/2016	-	-	6	6	
6/8/2016	4	-	5	5	
6/15/2016	-	-	6	6	
6/22/2016	4	3	6	6	
6/29/2016	-	-	6	6	
7/6/2016	4	-	6	6	Biweekly Entrainment
7/20/2016	4	-	6	6	
8/3/2016	4	-	6	6	
08/17/16[3]	4	3	4	4	
8/30/2016	-	-	6	6	
09/14/16[4]	-	-	5	5	
9/28/2016	4	-	6	6	
10/12/2016	-	-	6	6	
10/26/2016	4	-	6	6	
11/02/16[5]	-	-	4	5	Weekly Entrainment
11/9/2016	4	-	6	6	
11/16/2016	-	-	6	6	
11/21/2016	4	-	6	6	
11/30/2016	-	-	6	6	
12/7/2016	4	-	6	6	
12/14/2016	-	-	6	6	
12/20/2016	4	-	6	6	
12/28/2016	-	-	6	6	

In accordance with Settlement Agreement paragraph 2.1.6.b, in 2016 Dynegy Moss Landing continued to implement operational control measures at the MLPP to reduce flow. These measures involve MLPP written operating procedures limiting the duration of circulating water pump operation during unit startup and shutdown and limiting the number of circulating water pumps in operation during various unit operating configurations at less than full utilization. Dynegy Moss Landing also reduced flow during the spring and fall entrainment and impingement seasons by taking a total of 69 days of planned maintenance outages in February, March, October and November 2016. We also note that, due to limited demand in the relevant electricity market in 2016, Moss Landing Units 6 and 7 had a combined net capacity factor in 2016 of 1.4 percent, which resulted in limited actual cooling water intake flows for these units.

In addition, Dynegy Moss Landing completed the installation of variable speed drive controls on four circulating water pumps for Units 1 and 2 on December 16, 2016, meeting the Settlement Agreement paragraph 2.1.6 d. December 31, 2016 deadline.

Finally, in furtherance of evaluating compliance options discussed in the enclosed updated Implementation Plan to meet Track 2 requirements at MLPP, additional traveling screen flow studies were conducted in 2016.

If you have any questions concerning this annual update for 2016, please contact Lee Genz, Sr. Environmental Professional, at 831-633-6785 or by e-mail at Lee.Genz@dynegy.com.

Regards,

REX A. LEWIS
Managing Director
Moss Landing and Oakland Power Plants

LHGenz
Enclosue

cc: Mr. Ken Harris, Executive Officer
California Central Coast Regional
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Attn: Peter von Langen, PhD

Elizabeth Ewens, Ellison, Schneider & Harris L.L.P. (via email)

File: 403.40.09 MLPP 2016
Andreas Leskovsek (electronic copy)

Dynegy Moss Landing, LLC

State Water Resources Control Board
Once-Through Cooling Water Policy
Updated Implementation Plan
for the Moss Landing Power Plant

Revised February 2017

Prepared for:

Dynegy Moss Landing, LLC
Moss Landing Power Plant
Moss Landing, California

Prepared by:

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1.0 Introduction

On April 1, 2011, Dynegy Moss Landing, LLC submitted an Implementation Plan (2011 Implementation Plan) for the Moss Landing Power Plant (MLPP) in accordance with the California Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (Policy), which was adopted on May 4, 2010 by the California State Water Resources Control Board (SWRCB) and became effective on October 1, 2010, as subsequently amended.

The March 2015 updated Implementation Plan for the MLPP reflected the Settlement Agreement and Release (Settlement Agreement) executed on October 9, 2014 between the SWRCB and Dynegy Moss Landing, LLC, the owner and operator of the MLPP, regarding the Policy. A copy of the Settlement Agreement is attached as Attachment A. The Settlement Agreement required Dynegy Moss Landing, LLC to submit an updated Implementation Plan for MLPP within 30 days after the execution of the Settlement Agreement. The March 2015 updated Implementation Plan described the compliance alternative for MLPP as presented in the Settlement Agreement and the general design, construction and operational measures that would be undertaken to implement the compliance alternative, and provides a schedule for implementing these measures as set forth in the Settlement Agreement.

This February 2017 updated Implementation Plan for the MLPP includes changes to reflect the retirement of Units 6 and 7 on December 31, 2016, updated plans regarding supplemental control technology for Units 1 and 2 to comply with the Track 2 requirements, and other miscellaneous updates.

1.1 Overview of California Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling[1]

The Policy provides for two alternatives for compliance with the required reductions in impingement mortality and entrainment (IM&E) at power plant cooling water intake structures.

Compliance under Track 1 requires the following:

- Reduction of the intake flow rate at each unit, at a minimum, to a level commensurate to a closed-cycle wet cooling system (minimum 93 percent intake flow rate reduction for each unit compared to the unit's design intake flow rate), and
- Through screen intake velocity must not exceed 0.5 foot per second (fps).

[1] This overview presents a summary of relevant Policy provisions and is intended only as a convenience for the reader.

Installation of a closed-cycle dry cooling system meets the intent and minimum reduction requirements under Track 1.

If it can be demonstrated to the satisfaction of the SWRCB that compliance with Track 1 is not feasible, IM&E of marine life for the facility must be reduced on a unit-by-unit basis to a level comparable to that achievable under Track 1, using operational or structural controls, or both.

For impingement mortality, Track 2 requires:

- For plants relying solely on reductions in velocity, monthly verification that through screen intake velocities do not exceed 0.5 fps, or
- Monitored impingement mortality reductions of at least 90 percent of the reduction in impingement mortality required under Track 1 (i.e., at least 83.7 percent [90 percent of 93 percent]).

For entrainment, Track 2 requires:

- If relying solely on reductions in flow, by recording and reporting a minimum of 93 percent reduction in monthly flow as compared to the average actual flow for the corresponding months from 2000 to 2005, or
- Installation of control technologies (e.g., including, but not limited to, screens or re-location of intake structures), that, in whole or in part, would reduce entrainment at least 90 percent of the reduction required under Track 1 (i.e., at least 83.7 percent [90 percent of 93 percent]).

Technology-based improvements that are specifically designed to reduce impingement mortality and/or entrainment and were implemented prior to October 1, 2010 may be counted towards meeting Track 2 requirements.

The Policy also includes considerations for plants that installed more efficient combined-cycle units prior to October 1, 2010. For units such as MLPP Units 1 & 2, reductions in impingement mortality and entrainment resulting from the replacement of steam turbine units with combined-cycle units may be applied towards meeting the Track 2 requirements. The reductions would be based on the reduced intake flows, calculated as the difference between the maximum permitted flow for the entire plant prior to the installation of the combined-cycle units and the maximum permitted flow after installation of the units.

1.2 Summary of the Settlement Agreement[2]

The Settlement Agreement includes provisions addressing the MLPP's compliance track, final compliance date, interim and immediate requirements, compliance plan, baseline and technology studies and compliance monitoring. A copy of the Settlement Agreement is provided as Attachment A to this updated Implementation Plan. The following provides a summary of certain key terms of the Settlement Agreement as relevant to the MLPP Implementation Plan. Other terms of the Settlement Agreement are addressed in relevant sections of this updated Implementation Plan.

The Settlement Agreement provides that Track 1 at MLPP is not feasible, as defined in Policy section 5, and that MLPP may comply pursuant to Track 2 under Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii).[3]

In accordance with the Settlement Agreement, Track 2 compliance can be achieved by an 83.7% or greater reduction in impingement mortality and entrainment,[4] and the required Track 2 reductions may be achieved at MLPP by: (1) use of the prior flow reduction credit provided in Policy section 2.A.(2)(d), calculated and applied as described in Settlement Agreement paragraph 2.1.4,[5] to MLPP Units 1 & 2; (2) use of operational controls to further reduce flow; and (3) reductions in impingement mortality and entrainment through installation of technology controls, which can be calculated based on total numbers of fish larvae and other meroplankton.[6] The percent reductions in entrainment achieved by the technology controls may also be based on calculations of the numbers of fish larvae and other meroplankton of a specific age or size class that have been protected from the effects of entrainment for the species selected for analysis.[7] Further, compliance with the required Track 2 reductions can be computed, after application of the credit for MLPP Units 1 & 2, by combining the percent reduction from design flow achieved through flow control or operational measures with the reductions in impingement mortality and entrainment through the installation of technology controls, which can be calculated in accordance with Settlement Agreement paragraph 2.1.3.c.[8]

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[2] This summary of the Settlement Agreement and discussion of the Settlement Agreement in subsequent sections of the updated Implementation Plan are intended only as a convenience for the reader. The terms and conditions of the Settlement Agreement control.

[3] Settlement Agreement paragraph 2.1.2.

[4] Settlement Agreement paragraph 2.1.3.b.

[5] Settlement Agreement paragraph 2.1.4 provides that MLPP shall receive a credit for the prior reduction of 224 million gallons per day ("MGD") achieved by the replacement of prior Units 1–5 with combined-cycle Units 1 & 2 as provided in Policy section 2.A.(2)(d). The entire 224 MGD will be credited towards compliance for MLPP Units 1 & 2, which may then achieve compliance with Track 2 by additional reductions in impingement mortality and entrainment to meet the required Track 2 reduction pursuant to Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii).

[6] Settlement Agreement paragraph 2.1.3.c.

[7] *Id.*

[8] Settlement Agreement paragraph 2.1.3.d.

The Settlement Agreement provides that the SWRCB staff and Dynegy Moss Landing, LLC shall advocate to the SWRCB that it extend the final compliance date for all units at MLPP to December 31, 2020.[9] On April 7, 2015, the SWRCB adopted an amendment to the Policy that extended the final compliance date for all four MLPP units to December 31, 2020. The amendment to the Policy was approved by Office of Administrative Law on July 18, 2016.

1.3 Implementation Plan Organization

The 2011 Implementation Plan provided information and was organized based on the SWRCB's November 30, 2010 letter identifying seven requirements that must be included in an Implementation Plan.[10] The SWRCB's November 30, 2010 letter also requested information on how a facility would comply with the Immediate and Interim Requirements in section 2.C. of the Policy.

Much of the information in the 2011 Implementation Plan was included in the March 2015 update and is also included in this February 2017 updated Implementation Plan. The March 2015 update and this updated Implementation Plan incorporate, where appropriate, terms of the Settlement Agreement, which in certain instances replace, in part or in whole, some of the information provided in the 2011 Implementation Plan. The seven required information elements identified in the SWRCB's November 30, 2010 letter and the corresponding location of the information in the Implementation Plan updates are provided in **Table 1-1**.[11] The Immediate and Interim Requirements in Section 2.C. of the Policy that were addressed in Section III of the 2011 Implementation Plan and are now addressed in Section 3.4 of the Implementation Plan updates.[12]

This updated Implementation Plan contains six sections and one attachment. Section 1.0 provides an Introduction. Section 2 describes the MLPP, the source water body and its aquatic resources, and previous MLPP IM&E studies. Section 3 presents the compliance alternative selected by MLPP and describes the general design, construction and operational measures that will be undertaken to implement the alternative. Section 4 provides a compliance schedule for implementing the measures to meet the final compliance date of December 31, 2020. Section 5 provides methods for determining compliance. Section 6 provides the literature cited in this Plan. A copy of the Settlement Agreement is provided as Attachment A.

[9] Settlement Agreement paragraph 2.1.5. See also Settlement Agreement paragraphs 2.3.1. and 2.3.2.

[10] Letter from Thomas Howard, Executive Director, SWRCB, to Daniel Thompson, Moss Landing Power Plant, re "Implementation Plans and Immediate and Interim Requirements for the Once-Through Cooling Water Policy", Nov. 30, 2010.

[11] In accordance with the SWRCB's November 30, 2010 letter, the 2011 Implementation Plan also included a new application to renew the NPDES permit for MLPP. Dynegy Moss Landing, LLC intends to modify that pending permit application to reflect the retirement of Units 6 & 7 and the amendment of the OTC Policy extending the final compliance date for Moss Landing to December 31, 2020.

[12] To the extent the 2011 Implementation Plan, March 2015 Implementation Plan and this updated Implementation Plan differ, this updated Implementation Plan controls.

This Implementation Plan and the information contained herein are subject to material change. As recognized by the SWRCB, if an implementation plan or associated information changes after submittal, the facility may submit amendments at a later date. This Implementation Plan reflects information currently available and known to Dynegy Moss Landing, LLC and provides as much detail as is reasonably possible about future activities that are contingent on and affected by numerous currently unknown factors. Dynegy Moss Landing, LLC expressly reserves the right to, and intends to, amend and/or supplement this Implementation Plan as relevant information develops and circumstances warrant.

Table 1-1. Information requested in the November 30, 2010 letter from the SWRCB for Implementation Plans and corresponding sections where that information is included in the 2011 Implementation Plan and in the March 2015 and this Implementation Plan update.

Information required by SWRCB November 30, 2010 letter	Section in 2011 Implementation Plan	Corresponding Section in the March 2015 and February 2017 Updated Implementation Plan
1. Identify the selected compliance alternative	Section II.1	Sections 3.1 and 3.2
2. Describe the general design, construction or operational measures for the selected alternative	Section II.2	Section 3.2
3. Provide a schedule for implementing the selected measures	Section II.3	Section 4.0
4. Identify the periods when generating power is infeasible and the measures taken to coordinate with the electrical system balancing authority	Section II.4	Section 3.3
5. Describe any plans for repowering	Sections II.1.B and II.5	Section 3.2 (incorporating by reference Sections II.1.B and II.5 of the 2011 Implementation Plan)
6. Identify the transmission configuration around the units	Section II.6	Section 3.6 (incorporating by reference Section II.6 of the 2011 Implementation Plan)
7. Provide and describe any prior studies that reflect current levels of impingement and entrainment	Section II.7	Section 2.4 and 2.5

2.0 MLPP Description and Background

This section of the updated Implementation Plan presents information on the MLPP, the environmental setting for the plant, and summaries of previous IM&E studies.

2.1 Location

MLPP is located on the eastern shoreline of Moss Landing Harbor (**Figure 2-1**). This medium sized harbor, which provides dock space for approximately 600 commercial and recreational vessels, is located about 110 miles south of San Francisco. Moss Landing Harbor is located roughly midway between Santa Cruz and Monterey, California and is open to Monterey Bay. MLPP is located in a relatively undeveloped area that includes industrial facilities, agricultural lands, sparse residences, recreational beaches, and tidal wetlands.

2.2 Power Plant Description

MLPP originally consisted of seven generating units. Units 1–5 were built in the early 1950s and were retired in 1995. Units 6 & 7 were built in the late 1960s and were retired on December 31, 2016.

In Spring 2002, two new high efficiency combined-cycle (CC) generating units (Units 1 & 2) began commercial operation. Units 1 & 2 each generate 510 megawatts (MW) (**Table 2-1**). At full design flows Units 1 & 2 use about 360 MGD and Units 6 & 7 use about 864 MGD of ocean water that is used for once-through cooling to remove excess heat from the power generation process. The total permitted flow for all four units through Discharge 002 as specified in Waste Discharge Requirements Order No. 00.041 in NPDES Permit No. CA0006254 issued October 27, 2000 is 1,226 MGD. This represents a reduction of 224 MGD from the combined flow through Discharge 001 and Discharge 002 of 1,450 MGD (560 and 890 MGD, respectively), which is the basis for the 224 MGD credit provided for in the Agreement (see Attachment A, paragraph 2.1.4).

MLPP has two separate intake structures in Moss Landing Harbor for withdrawal of cooling water (**Figure 2-2**). The Units 1–5 intake structure was upgraded and serves as the new combined-cycle Units 1 & 2 intake. The Units 1 & 2 intake structure is located at 36° 48'25" N. Latitude, 121°47'05" W. Longitude. The Units 1 & 2 intake structure extends down to a depth of 20 feet below mean lower low water (MLLW). The Units 6 & 7 intake structure, which is no longer operational, is located at 36° 48'17" N. Latitude, 121°47'04" W. Longitude.

The discharge volume from Units 1 & 2 is divided between two separate conduits (previously also used by Units 6 & 7) that carry the discharge to a submerged offshore discharge structure located in Monterey Bay about 2,400 feet from the plant, and approximately 600 feet offshore.

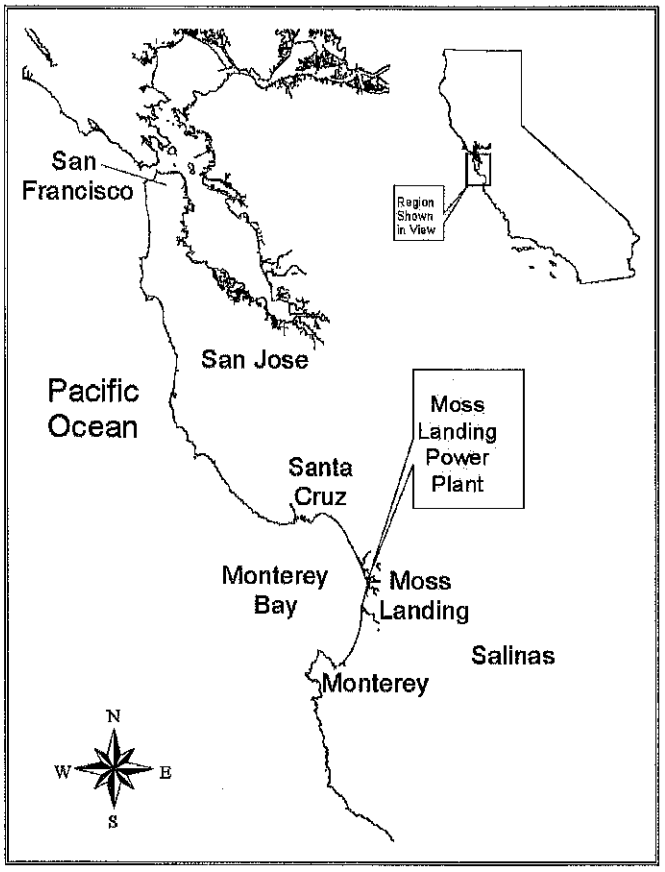

Figure 2-1. The location of the Moss Landing Power Plant.

Table 2-1. Electrical output (megawatts) and design cooling water flows (MGD and gpm) for the four units at Moss Landing Power Plant.

	Unit				
	1[1]	2[1]	6[2] (retired)	7[2] (retired)	**Total** (before retirement of 6&7/**after retirement of 6&7**)
Design Capacity (MW)	510	510	754	755	2,529/**1,020**
Design Flow per Unit (MGD)	180	180	432	432	1,224/**360**[3]
Design Flow per Unit (gpm)	125,000	125,000	300,000	300,000	850,000/**250,000**

1. Units 1 & 2 each are equipped with 3 circulating water pumps.
2. Units 6 & 7 each are equipped with 2 circulating water pumps.
3. Maximum permitted flow for all units is 1,226 MGD (including industrial waste streams) (NPDES Permit still shows 1,226 MGD and is administratively extended).

Source: NPDES Permit No. CA 0006254.

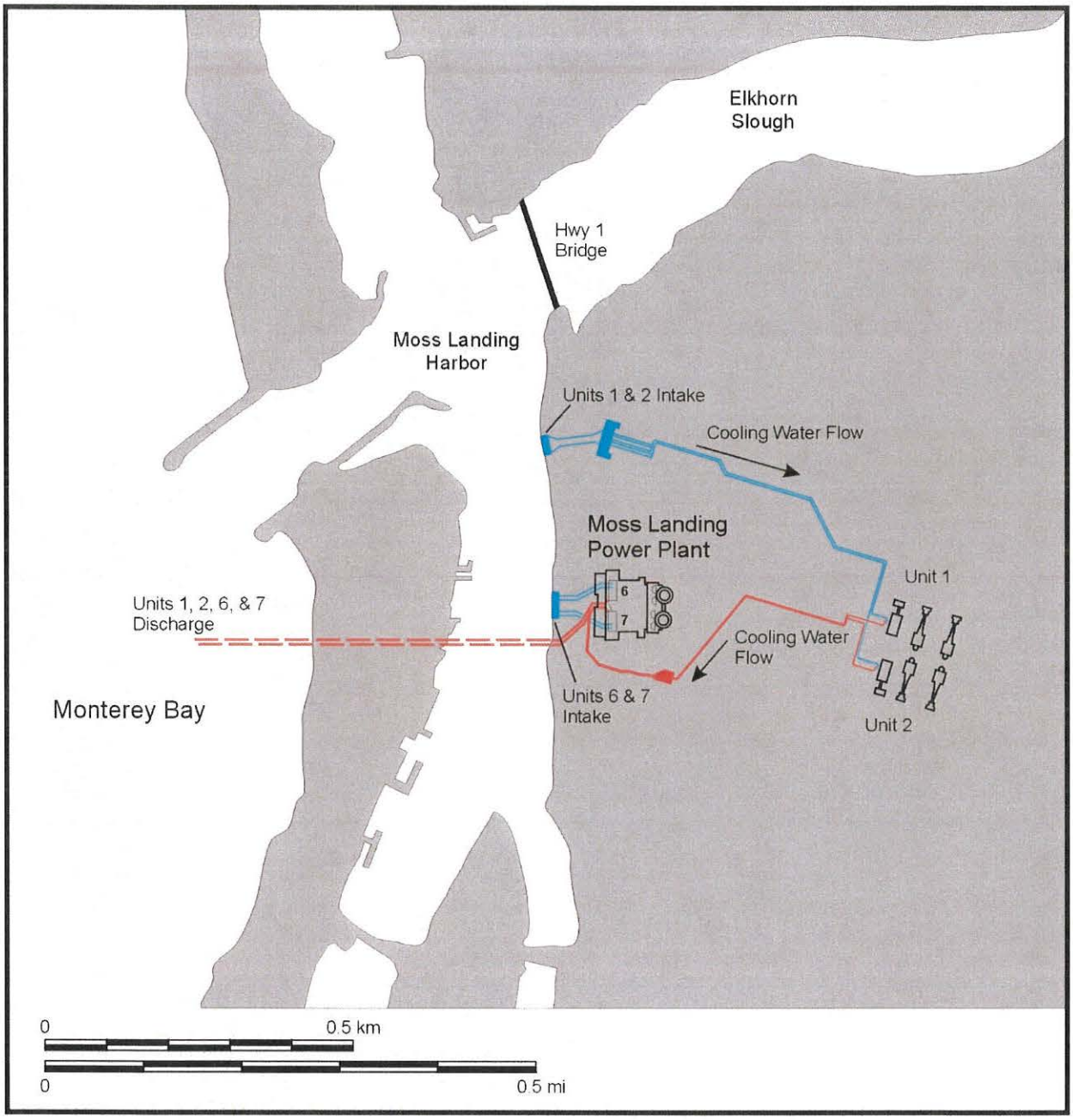

Figure 2-2. Map of Moss Landing Power Plant showing locations of both intake structures, cooling water conduits, and discharge structure.

2.2.1 Units 1 & 2

Units 1 & 2 are two 510 MW combined-cycle generating units that began commercial operation in Spring 2002. Each unit is cooled by three circulating water pumps (CWP) having a total combined flow of 180 MGD (125,000 gpm). Cooling water is drawn from Moss Landing Harbor, entering the system through an intake structure located on the east side of the Harbor, about 500 feet south of the entrance to Elkhorn Slough (**Figure 2-2**). The concrete intake structure was originally built to serve the plant's now retired Units 1–5 that were constructed in the 1950s. Units 1–5 were permanently retired in 1995, and the intake was later upgraded to meet the debris filtration needs of the new Units 1 & 2.

Water entering the system initially passes through a bank of bar racks (**Figure 2-3**). The bars are positioned with approximately 4 inch center-to-center spacing, which provides 3½-inch wide openings between bars. The bar racks extend from the deck of the intake structure, 9.6 feet above MLLW, down to the Harbor bottom at a depth of 20.1 feet below MLLW. Debris impinged on the bars is removed by an automated raking system and deposited in a receptacle for subsequent disposal in a landfill.

Located approximately 20 feet behind the bar racks are the traveling water screens (TWS) (**Figure 2-3**). The TWS remove most of the debris that is small enough to pass through the bar racks, but large enough to potentially clog the plant's condenser tubes. Each generating unit has a bank of three screens. Each of the screens is 10 feet wide and extends down to the floor of the intake structure, 20 feet below MLLW. When the TWS are in operation, cooling water passes through an upward rotating belt of stainless steel screen with an effective mesh size of 5/16 inch. The screen belt lifts debris out of the flow stream and carries it to the top of the TWS where a seawater screenwash system sprays the debris off the screen and onto a conveyor belt. The conveyor belt carries the debris to the same receptacle utilized by the bar rack rake system. The Units 1 & 2 TWS are inclined 35 degrees from vertical to increase their ability to retain debris. This also reduces the through screen velocity by presenting a larger screen area to the flow than would be presented by a vertical TWS. The traveling screens are normally operated (rotated) every four hours for a period of 20 to 30 minutes. They can also be activated automatically during periods of high debris loading if the differential water height between the upstream and downstream sides of the TWS exceeds a predetermined value due to clogging of the stationary screen.

During the September 2011 survey (Tenera 2011a) when all six CWPs were operating at full flow, water velocity immediately in front of the Units 1 & 2 bar racks ranged from 0.39 to 0.42 feet per second (fps) among the six intake bays, and averaged 0.41 fps over the entire intake (**Table 2-2**).

Table 2-2. Water velocities measured[1] or estimated[2] at full circulating water pump flow for several locations throughout the Moss Landing Power Plant Units 1 & 2 intake structure.

Location	Water Velocities (fps)
Approach to bar racks	0.41[1]
Approach to screens	0.44[2]
Through screens	0.92[2]

1. Approach-to-bar-rack measurements made by Tenera during a survey conducted in September 2011.
2. Approach-to-screen and through screen design water velocities estimates were based on calculations made by intake screen manufacturer (FPI August 2005).

The CWPs that supply cooling water to Units 1 & 2 are located approximately 300 feet downstream of the TWS (**Figure 2-3**). Each generating unit has three CWPs that provide a total cooling water flow of 180 MGD (125,000 gpm) to its steam condenser and other heat exchangers.

Each of the three CWPs discharges into individual 48-inch pipes which, after a run of about 200 feet, join together into a single 84-inch diameter pipe (**Figure 2-2**). The two 84-inch lines (one per unit) carry the cooling water a distance of about 2,000 feet to the Units 1 & 2 condensers. Upon exiting the condensers, the two discharge lines feed into a single 120-inch discharge pipe that runs about 1,400 feet to the disengaging basin. The disengaging basin is a concrete reservoir, open to the atmosphere, where turbulent mixing aerates the discharge flow and provides some cooling. The basin also acts as a vacuum breaker and prevents siphoning of the discharge flow. The discharge exits the disengaging basin via two discharge conduits that run about 600 feet to a point just west of the Units 6 & 7 turbine building where they join the retired Unit 6 and Unit 7 discharge lines. Stop logs can be inserted at the disengaging basin to direct the Units 1 & 2 discharge into either of the discharge lines or, as is normally the case, they can be removed to allow the flow to be split between the two discharge lines. The two discharge conduits carry the combined discharge of Units 1 and 2 approximately 2,400 feet from the plant to the discharge structure located approximately 600 feet offshore in Monterey Bay.

2.2.2 Units 6 & 7 (Retired, December 31, 2016)

Units 6 & 7 were retired December 31, 2016. The following information regarding the former operations of Units 6 & 7 is provided for background purposes only.

The Units 6 & 7 intake structure is located on the east shore of Moss Landing Harbor about 800 feet south of the Units 1 & 2 intake structure (**Figure 2-2**). The structure has many of the same features found at the Units 1 & 2 intake, bar racks and traveling water screens, but the layout is considerably different (**Figure 2-4**). The bar racks are located behind a vertical curtain wall that extends down to 3.3 feet below MLLW. The wall prevents large floating debris from being impinged on the bar racks. The spacing between bars is about 3 inches.

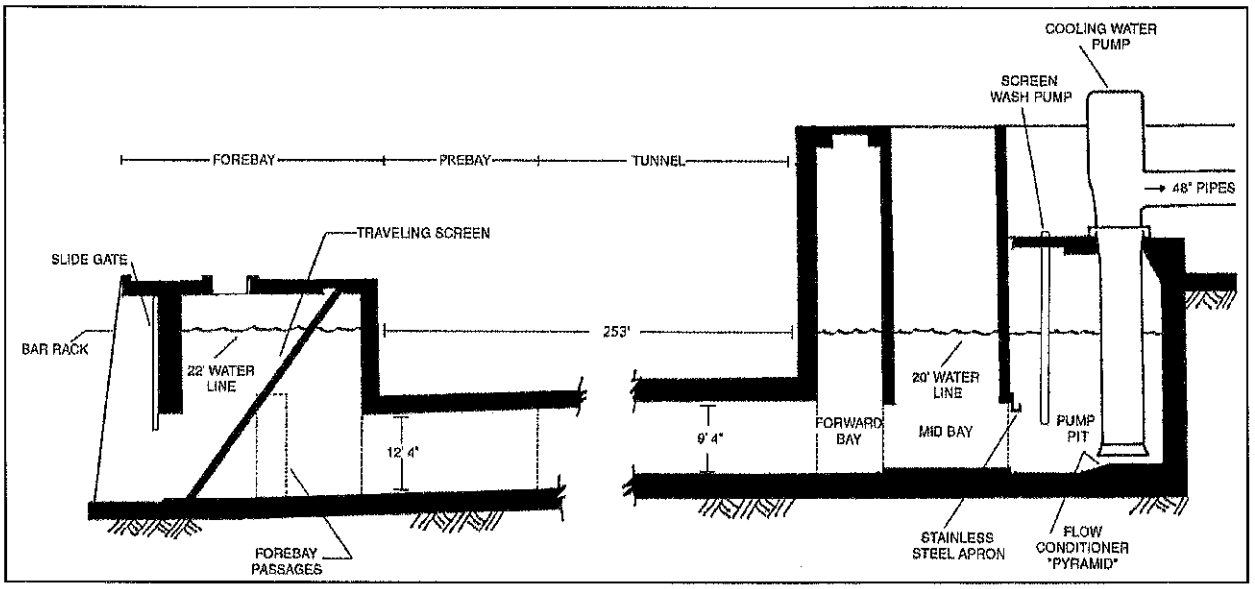

Figure 2-3. Cross-sectional diagram of the Units 1 & 2 intake structure and pump bays.

Traveling water screens are located about 25 feet downstream of the bar racks. These are vertical traveling screens with 3/8-inch screen mesh. Each Unit has four 10-foot wide TWS, two per CWP, that extend down to the floor of the intake structure (20 feet below MLLW). The screenwash system removes debris from the screens, and flushes it into a sluiceway that empties into a screenwash wet well. The screenwash discharge, less the impinged material, is returned to Monterey Bay by large-diameter screen refuse pumps that empty into the discharge conduits of Units 6 & 7. The impinged material that is retained in the wet well is periodically removed by a local refuse collection contractor and trucked to a sanitary landfill for disposal. Due to the limited operation of Units 6 & 7, the traveling screens are currently rotated and cleaned on an as-needed basis. They can also be activated automatically during periods of high debris loading if the differential water height between the upstream and downstream sides of the TWS exceeds a predetermined value due to clogging of the stationary screen. The screens can also be run continuously, as a precaution, when debris levels are high.

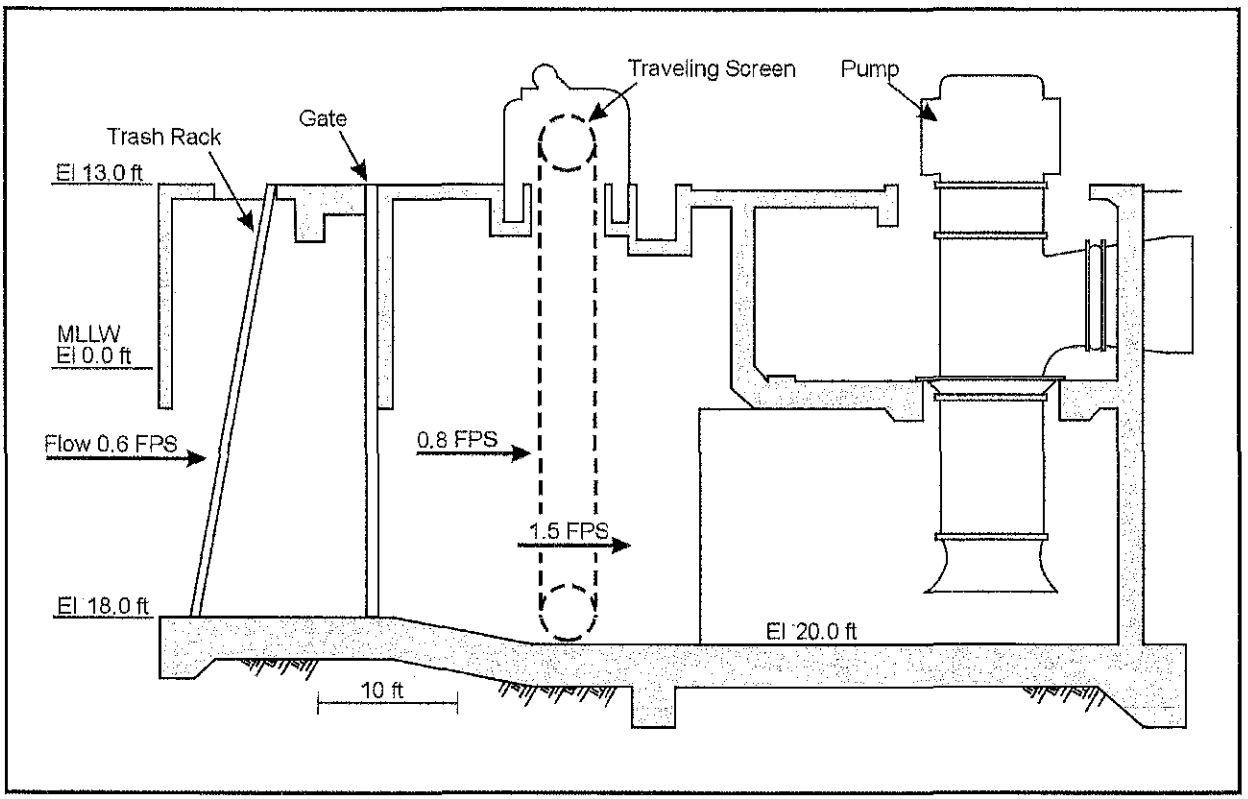

Figure 2-4. Cross-sectional diagram of the Units 6 & 7 intake structure.

During a September 2011 survey when all four CWPs were operating at full flow, water velocity immediately in front of the Units 6 & 7 bar racks ranged from 0.57 to 0.88 fps among the eight intake bays, and averaged 0.70 fps over the entire intake (Tenera 2011a). Water velocity at the TWS has not been measured in recent years but was calculated in the past to be 0.8 fps approaching the TWS and 1.5 fps through the screens (**Table 2-3**).

Table 2-3. Water velocities measured[1] or estimated[2] at full circulating water pump flow for several locations throughout the Moss Landing Power Plant Units 6 & 7 intake structure.

Location	Water Velocities (fps)
Approach to bar racks (average)	0.7[1]
Approach to screens	0.8[2]
Through screens	1.5[2]

1. Approach-to-bar-rack measurements made by Tenera during a survey conducted in September 2011.

2. Values reported in PG&E (1983). Pacific Gas and Electric Company. Moss Landing Power Plant Cooling Water Intake Structures 316(b) Demonstration.

Both generating units have two CWPs that each provide a nominal flow of 150,000 gpm (300,000 gpm [432 MGD] per unit). Unlike the Units 1 & 2 CWPs, the Units 6 & 7 pumps are located immediately behind the TWS (about 30 feet) and about 400 to 450 feet upstream of the Units 6 & 7 condensers. Each CWP discharges into its own conduit. Each conduit supplies cooling water to half of a generating unit's condenser. Upon exiting the condenser, the cooling water from both condenser halves flows into a common discharge conduit. The discharge from Unit 6 remains separate from that of Unit 7. The discharge flow from Units 1 & 2 joins the Units 6 & 7 discharge about 100 feet downstream of the condensers. The flow from Units 1 & 2 can be directed in its entirety into either the Unit 6 or Unit 7 conduit, but is normally split between the two. The two separate subsurface discharge conduits carry the flow from each unit to a submerged offshore discharge structure located in Monterey Bay 2,400 feet from the plant, and approximately 600 feet offshore.

2.2.3 Analysis of Recent Generation and Flow Data

The MLPP generation and average daily cooling water usage over the period 2012 through 2016 are shown in **Tables 2-4 and 2-5**. Annual generation is presented as a percentage of the design basis capabilities of each unit.

Table 2-4. Moss Landing Power Plant yearly generation capacity factor by unit for 2012–2016.

Unit Number	Yearly Generation Capacity Factor (percentage of design basis)					
	2012	2013	2014	2015	2016	Average
Unit 1	49.40	51.39	41.5	37.6	26.0	41.18
Unit 2	49.55	52.98	49.7	39.2	27.6	43.81
Units 1 & 2	49.48	52.19	45.6	38.4	26.8	42.49
Unit 6	4.69	4.06	0.9	4.9	1.1	3.13
Unit 7	4.19	1.71	0.3	3.2	1.7	2.22
Units 6 & 7	4.44	2.89	0.6	4.1	1.4	2.69

Table 2-5. Moss Landing Power Plant annual daily average circulating water flow in MGD for 2012–2016.

Unit Number	Design Flow (MGD)	Daily Average Circulating Water Flow (MGD)					
		2012	2013	2014	2015	2016	Average
Unit 1	180	124.31	127.19	97.84	99.8	86.46	107.12
Unit 2	180	123.33	126.76	126.45	97.27	90.07	112.78
Units 1 & 2	360	247.64	253.95	105.23	98.54	88.26	158.72
Unit 6	432	78.81	67.99	12.25	68.36	27.73	51.03
Unit 7	432	70.49	32.85	8.34	43.0	27.25	36.49
Units 6 & 7	864	149.30	100.84	30.3	55.68	27.49	72.72

2.3 Source Water Body Description and Aquatic Biological Resources

The MLPP is situated at the intersection of three distinct marine geographic areas: Elkhorn Slough (tidal lagoon), Moss Landing Harbor, and Monterey Bay. Each of these areas has its own unique aquatic biological habitats. Distinct aquatic habitats present within the boundaries of Moss Landing Harbor and Elkhorn Slough include shallow open water, submerged aquatic vegetation, sand/mud/salt flats, fresh/salt/brackish marshes, rocky subtidal and intertidal. Distinct habitats present in Monterey Bay include sandy beach, rocky intertidal and subtidal and open water areas.

2.3.1 Elkhorn Slough / Moss Landing Harbor

Elkhorn Slough is a narrow, shallow water embayment that extends 6.2 miles inland from the eastern margin of Monterey Bay. As it extends inland, it gradually narrows and decreases in depth. Tidal mud flats and pickleweed (*Salicornia* spp.) marsh extend the length of the slough. The drainage basin for Elkhorn Slough is small, only 226 square miles in area. The land near the slough is used primarily for agriculture. Shallow open water and lagoon habitats comprise the majority of aquatic habitat provided by the Elkhorn Slough and Moss Landing Harbor complex.

Several changes have occurred in the hydrology and channel geomorphology since the time of the PG&E entrainment and impingement studies in 1978–1980 (Malzone and Kvitek 1994, Oxman 1995, Lindquist 1998). In the mid 1980s several dikes and levees surrounding pasture lands were reopened to tidal flow. These changes increased the surface wetlands by 48 percent and the tidal volume by 43 percent (Malzone and Kvitek 1994). The increased volume of water exchanged with the tides has increased both the rate of erosion and the velocity of the tidal currents (Philip Williams and Associates 1992, cited in Lindquist 1998, Malzone and Kvitek 1994). Recent studies of the effects of this erosion on the ecology of the slough (Lindquist 1998) and studies of the prey availability for harbor seals (Oxman 1995) provide updated information on the species composition of adult fishes in the slough. Yoklavich et al. (2002) discuss data collected from numerous studies (past and present) on fish assemblages found in Elkhorn Slough habitats and surrounding marine waters.

The varied marine and estuarine habitats within Elkhorn Slough provide habitat for at least 97 species of fish (representing 40 families) (Yoklavich et al. 1992, 2002). Most (76) of these species are marine species from Monterey Bay. Fish species utilizing the slough were divided by Yoklavich et al. (2002) into several groups. Immigrant marine species typically use the slough for spawning or as a nursery ground. These species include the northern anchovy *Engraulis mordax*, Pacific herring *Clupea pallasi*, and cabezon *Scorpaenichthys marmoratus*. Numerous species of flatfish including the speckled sanddab *Citharichthys stigmaeus*, English sole *Parophrys vetulus*, sand sole *Psettichthys melanostictus*, starry flounder *Platichthys stellatus*, California halibut *Paralichthys californicus*, and several species of turbot are also considered

immigrant marine species. Fish species considered permanent residents include the Pacific staghorn sculpin *Leptocottus armatus*, black surfperch *Embiotoca jacksoni*, striped mullet *Mugil cephalus*, bay pipefish *Syngnathus leptorhynchus*, and five species of gobies. Partial residents, or species that live or reproduce in the slough but migrate to the ocean during certain seasons or life stages, include the jacksmelt *Atherinopsis californiensis*, shiner surfperch *Cymatogaster aggregata* and white surfperch *Phanerodon furcatus*, leopard shark *Triakis semifasciata*, and bat ray *Myliobatis californica*. Species primarily associated with freshwater include the American shad *Alosa sapidissima* and threadfin shad *Dorosoma petenense*, mosquitofish *Gambusia affinis*, prickly sculpin *Cottus asper*, threespine stickleback *Gasterosteus aculeatus*, and striped bass *Morone saxatilis*. Few non-native species have been noted (yellowfin goby *Acanthogobius flavimanus*, mosquitofish, American shad, and striped bass).

In 1991, otter trawls were conducted as part of a study of fish availability as prey items for harbor seals (Oxman 1995). Otter trawls were conducted monthly for a year (1991) in Elkhorn Slough in an effort to establish seasonal trends of fish availability and distribution. The trawls were taken at the same three stations (Bridge, Dairies, and Kirby Park) sampled by Nybakken et al. (1977) and reported by Yoklavich et al. (1992) in the main channel of the slough. Eighty-three daytime otter trawls captured 1,955 fish representing 41 species. The 29 nighttime trawls at two stations (Dairies and Bridge) resulted in the collection of 1,461 fishes representing 39 species. The lower numbers caught during the day may have been a result of fishes avoiding the net.

More than 90 percent of the fishes taken in the daytime and nighttime trawls were represented by 11 species. These fishes included shiner surfperch, English sole, Pacific staghorn sculpin, California tonguefish *Symphurus articauda*, speckled sanddab, white surfperch, cabezon, black surfperch, and lingcod *Ophidion elongatus*. Pipefish *Syngnathus* spp. were caught during the daytime trawls and brown rockfish *Sebastes auriculatus* were caught at night.

Oxman (1995) reported that overall there was a slight change in the 1991 diurnal fish assemblage from that reported by Yoklavich et al. (1992) during 1974–1976. These changes included a decrease in the mean number of fish per tow, species diversity decrease at the Bridge and Dairies stations, and species diversity increases at Kirby Park. Species absent from the 1991 daytime trawls that were present in 1974–1980 trawls included topsmelt *Atherinops affinis*, jacksmelt, Pacific herring, threadfin shad, sand sole, blue rockfish *Sebastes mystinus*, queenfish *Seriphus politus*, and night smelt *Spirinchus starksi*. Several species were less abundant. English sole, cabezon, lingcod, and California tonguefish increased in relative abundance and density.

Oxman (1995) stated that there was a significant change in fish assemblages at the Bridge and Dairies stations since the 1974–1980 otter trawls. Several species were absent and many were caught in less abundance in the 1991 tows. English sole, lingcod, and California tonguefish increased in relative abundance and density.

Lindquist (1998) collected fishes by otter trawl to provide information on their feeding habits from four stations in Elkhorn Slough from May 1996 to May 1997. He analyzed 11 species of fish from nine families. The species were yellowfin goby, topsmelt, speckled sanddab, arrow goby *Clevelandia ios*, Pacific herring, shiner surfperch, northern anchovy, Pacific staghorn sculpin, white surfperch, English sole, and California tonguefish. These species accounted for 96 percent of the total abundance from the otter trawls. Of those species all but yellowfin goby and California tonguefish were dominant fishes during studies conducted in Elkhorn Slough in the 1970s (Lindquist 1998).

Yoklavich et al. (2002) discussed several distinct habitat types which have been sampled within the slough. Different sampling methods were used for each habitat type (otter trawl, beach seine, and channel nets). The most abundant and diverse family of fishes within the slough and surrounding coastal waters are the embiotocids or surfperches. Shiner surfperch was the most common species found throughout the habitats studied and the Pacific staghorn sculpin was the most abundant species in upper slough areas. Several large elasmobranchs are also relatively common within the slough (bat ray, shovelnose guitarfish *Rhinobatos productus*, gray smoothhound *Mustelus californicus*, and leopard shark (Yoklavich et al. 2002, San Filippo 1994).

Yoklavich (2002) concluded that in general, fish assemblages present in Elkhorn Slough in the 1990s were characterized by decreased abundance at most sample sites as well as less diversity than in the past. Within the last 20 years a homogenization of fish assemblages appears to have occurred between the lower main channel and tidal channels. These changes coincided with the continued erosion and scouring of smaller channels to the point that they are now similar (in habitat type) to the main channel (Malzone and Kvitek 1994).

The most abundantly collected fishes from studies reported in Nybakken et al. (1977), Yoklavich et al. (1991), from PG&E impingement studies in 1978–80 (PG&E 1983), and from Lindquist (1998) generally have remained the same. Northern anchovy, shiner surfperch, and Pacific herring were some of the most abundantly collected fishes from all three of these studies. Topsmelt was the only species collected in high numbers in impingement samples that was not collected during the other two studies. Oxman's (1995) studies in 1991 however, showed greater differences in species composition when compared to the other studies with the exception of the presence of shiner surfperch. This species was collected in high numbers in the slough during all studies. Fishes that were not collected in Oxman's study but were present in high numbers in all other studies were northern anchovy and Pacific herring. Both of these missing species were again collected in high numbers in Lindquist's 1996–1997 studies.

2.3.2 Monterey Bay

Monterey Bay, California's largest open-coast embayment, is formed by the extent of shoreline between Santa Cruz and Monterey and by the offshore depths of the Monterey Submarine Canyon. The opening of the bay is 23 miles across and 10 miles wide. Four main tributaries, the

Pajaro River, Elkhorn Slough, the Salinas River, and the San Lorenzo River flow into the bay. The bay's immense supply of cold, nutrient-rich, ocean water is exchanged tidally with the Elkhorn Slough and harbor located midway along the bay shoreline at the head of the canyon.

Monterey Bay lies within the boundaries of the Monterey Bay National Marine Sanctuary (MBNMS). The MBNMS extends from 7 miles north of the Golden Gate Bridge to Cambria Rock in northern San Luis Obispo County. The sanctuary contains about 400 statute miles of coastline and extends an average of 30 miles offshore. Its total area is 5,322 square miles. The MBNMS was officially established in 1992 by the authority of the Secretary of Commerce under the 1972 Marine Protection, Research and Sanctuaries Act. The MBNMS is one of fourteen marine sanctuaries in the United States under the jurisdiction of the National Oceanic Atmospheric Association (NOAA) of the U.S. Department of Commerce.

Monterey Bay is characterized by a gently sloping shelf cut by a system of submarine canyons, the largest of which is the Monterey Submarine Canyon. The head of this canyon is located off of the entrance to Moss Landing Harbor. The depth of the canyon ranges from 60 feet to 2,800 feet. The canyon is 650 feet wide at the head and approximately 7.5 miles wide at the mouth of Monterey Bay.

Monterey Bay's sandy beach habitat extends in nearly a continuous reach of approximately 20 miles from Santa Cruz to Monterey, encompassing the Moss Landing area. Beach habitat in the area of Moss Landing is exposed to high-energy waves from the northwest. Large quantities of sand are annually transported on and off the beach shoreline by strong waves and longshore currents. The continuously changing nature of this habitat favors mobile invertebrate and fish species that adjust quickly to the depletion and accretion of sediments. Relatively few species are able to adjust to this habitat.

The marine resources of Monterey Bay support a variety of commercial fisheries (Starr et al., 1998). Many of the fisheries are very dynamic. Landings are driven by the demands of the market, the abundance of the target species, and attempts by the regulators to reduce harvest. As new markets are found for species that were previously unmarketable or of low value, annual landings of those species can increase rapidly. Landings from other fisheries decline as fishermen fill the demands of the new markets. Regulation of fish harvest, entry into a fishery, gear usage, and season length can have a pronounced effect on landings. Fisheries also decline and expand with the cycles of abundance and scarcity of the targeted species. Long-term over-exploitation of many fish stocks along the Pacific Coast has decreased the abundance of adult fishes and recently led to more restrictive regulation of harvest levels. Some regulations were made because of concerns regarding declines in populations. Declines in landings often follow regulatory efforts and may not directly reflect species abundance. Because of the complexity of the forces driving fish harvest in the Monterey Bay area, generalizations about fish abundance based on landing data must be made carefully.

Fishes and invertebrates are harvested from the Monterey area using a variety of fishing methods. A majority of the fishes landed in Monterey ports between 1975 and 1998 were taken with purse seine and trawl nets. Purse seining is used to harvest pelagic species such as market squid *Loligo opalescens*, Pacific sardine *Sardinops sagax*, northern anchovy, and both Pacific mackerel *Scomber japonicus* and jack mackerel *Trachurus symmetricus*. Commercial trawlers in the area target a variety of demersal fish species, or groundfish. Set gillnets have traditionally been used to harvest California halibut, rockfish *Sebastes* spp., white croaker *Genyonemus lineatus*, and a variety of sharks. Commercial fishermen use trolling gear to harvest salmon and albacore during the seasons when they are abundant in the area. Hook- and line- gear has traditionally been used to harvest rockfish and lingcod over rocky reefs near the canyon. Set longlines, which are now prohibited in nearshore waters (within 1 mile), are used in the Monterey canyon area to take sablefish *Anoplopoma fimbria* and grenadier (Family Macrouridae). Fish traps and "stick gear" are used in the recently established live rockfish fishery. Traps are also used to take rock crabs *Cancer* spp. and Dungeness crab *Metacarcinus magister*.

2.4 Previous Impingement and Entrainment Studies

2.4.1 1978–1980 Cooling Water Intake Structures 316(b) Demonstration

In response to the requirements of Section 316(b) of the Clean Water Act, PG&E conducted an intensive study in 1978–1980 of the entrainment and impingement of fishes and macroinvertebrates resulting from the operation of the MLPP cooling water system (PG&E 1983).

2.4.1.1 Entrainment

The objective of the PG&E entrainment abundance and survival studies at MLPP was to estimate the number and taxa of organisms exposed to the plant's cooling water system, and to determine if organisms survived contact with the Plant's cooling water system. The entrainment abundance and survival studies focused on the early life stages of fishes (ichthyoplankton) and selected macroinvertebrates (amphipods, shrimps, and crabs). The species composition, length (for ichthyoplankton), and the seasonal and diel patterns of entrainment were also determined.

The numbers of ichthyoplankton and macroinvertebrates entrained were estimated by sampling a portion of the cooling water flow for a period of 24 hours once a month for 16 months (November 20, 1978–March 13, 1980) and once per week for 12 months (March 29, 1979–March 17, 1980) at Units 6 & 7, and then multiplying the densities of ichthyoplankton and macroinvertebrates observed by the volumes of cooling water withdrawn by the Plant. Entrainment sampling was conducted from three levels (top, middle and bottom) in a Units 1–5 bar rack intake forebay and from two levels (middle and bottom) in a Unit 6 intake bar rack

forebay. When Unit 6 was removed from service for repairs (December 21, 1979 through February 1980), sampling was conducted from a Unit 7 bar rack forebay.

The most abundant fish larvae and juveniles entrained were northern anchovy, silversides Atherinopsidae, gobies Gobiidae, smelts Osmeridae, Pacific staghorn sculpin, white croaker, longjaw mudsucker *Gillichthys mirabilis*, and Pacific herring. These species accounted for 94 percent of the fish collected. The larval and juvenile fish susceptible to entrainment were typically small; most species had mean lengths < 10 mm (0.4 inch). Fish larvae and juveniles were collected throughout the year, with greatest density (expressed as the number or organisms per cubic meter of cooling water) in winter and spring (> 7.8/m^3) and lowest density in summer (typically < 1/m^3). Fish eggs were also collected year round, with greatest density occurring during the summer and fall (> 40/m^3). A majority (70 percent) of the eggs, larvae, and juvenile fish collected were entrained at night. The fish species collected during the entrainment study are common and widely distributed along the Pacific Coast; their planktonic life stages (i.e., eggs and larvae) are widely distributed by tidal and ocean currents (PG&E 1983).

Several species of invertebrates were collected. These species comprised mostly the amphipods, *Jassa falcata* and *Corophium* spp., and the larvae of several noncommercial crabs: Pinnotheridae, *Pachygrapsus crassipes* and *Hemigrapsus oregonensis*. Macroinvertebrates were collected throughout the year with greatest densities (greater than 20/m^3 for many species) occurring during the spring and summer. No diel distribution patterns were recorded for invertebrates with the exception of the crab larvae (*Cancer* spp.) which were collected primarily (58 percent) between 0600 and 0900 hours. The macroinvertebrates collected during the entrainment study are common and widely distributed along the Pacific Coast.

2.4.1.2 Impingement

Impingement studies were conducted in 1978–1980 and the results were presented in the Moss Landing Power Plant Cooling Water Intake Structures 316(b) Demonstration (PG&E 1983).

Northern anchovy was the most abundant fish species collected in the impingement studies, constituting 44 percent of the fish collected at Units 1–5 and 76 percent at Units 6 & 7. Northern anchovy, shiner perch, topsmelt, and Pacific herring together accounted for 83 percent of the 327,415 fish collected in impingement studies. Impinged fish ranged in length from a 0.4-inch jacksmelt to a 60-inch bat ray; the overall average length was 4 inches. The impingement of fishes was highest during the summer and fall, with peaks exceeding 10,000 fish per day at each intake on five sampling days during August, September, and October. Approximately 80 percent of the fishes collected were impinged at night. These species are abundant in the Monterey Bay area and common in bays and coastal waters along the Pacific Coast.

A majority (62 percent) of the 36,830 macroinvertebrates collected was impinged at the Units 1–5 intake. Brown rock crab *Romaleon antennarium*, red rock crab *Cancer productus*, and yellow crab *Metacarcinus anthonyi* constituted 37 percent of the number of macroinvertebrates impinged at Units 1–5 and 9 percent at Units 6 & 7. Shrimps of the genus *Crangon* constituted

19 percent of the macroinvertebrates collected at Units 1–5 and 31percent at Units 6 & 7. Impingement of macroinvertebrates was highest during the early summer and in winter, with the highest peak (6,165 individuals on one sampling date, all units combined) in January. Approximately 60 percent of the macroinvertebrates collected were impinged at night.

The overall rate of impingement (standardized for differences in cooling water flow) for both fish and macroinvertebrates was higher at the Units 1–5 intake than at the Units 6 & 7 intake by a factor of 1.6 for fish and 3.3 for macroinvertebrates (PG&E 1983).

2.4.2 1999–2000 Cooling Water Intake Assessment Entrainment Study

The field studies and data analyses for the proposed modernization project followed a Study Plan developed in coordination with a Technical Working Group (TWG) established under the auspices of the Central Coast Regional Water Quality Control Board (Tenera 1999).

2.4.2.1 Methods

Entrainment sampling began March 2, 1999 and continued through February 24, 2000 immediately offshore of the Units 1 & 2 and Units 6 & 7 intake structures. Samples were collected once per week during the peak larval fish season (November through June) and every other week during the off-peak period. Samples were collected by towing a bongo frame with two 2.3 ft diameter openings and equipped with two 335 μm mesh plankton nets and codends. Samples were collected over a continuous 24-hour period; each period was divided into six, 4-hour sampling cycles. Two tows were conducted during each cycle. The bongo nets were lowered as close to the bottom as possible. Once the nets were at the correct depth, the boat was moved forward and the nets retrieved at an oblique angle (winch cable at a 45° angle). Each net mouth was fitted with a calibrated flowmeter to record the water volume filtered (Tenera 2000).

During laboratory processing all larval fishes and the megalopal stage of selected crab species were removed from the samples. European green crab *Carcinus maenas* megalops were searched for and removed from the samples. Larval fishes and targeted crab species megalops were identified to the lowest taxonomic level practicable and the lifestages of larval fishes were identified and recorded on the data sheet. Lengths of larval bay goby and longjaw mudsucker were obtained using a computer imaging system and image analysis software.

Entrainment effects were assessed using three independent models and assuming 100 percent design flows for circulating water and screenwash pumps. Two of the models, Fecundity Hindcasting (FH) and Adult Equivalent Loss (AEL), used species' life history information to estimate the potential numbers of adults represented by the entrainment losses. The third approach, Empirical Transport Modeling (ETM), compared entrainment larval concentrations to source water larval concentrations to calculate the effects of larval removal on the standing stock of larvae in Monterey Bay and Elkhorn Slough.

2.4.2.2 Results

Eight taxa of larval fishes comprised 95 percent of the total of the 66 taxa collected in entrainment samples (**Figure 2-5**) (Tenera 2000). The taxa, listed in decreasing order of abundance, were: unidentified gobies Gobiidae (53.2 percent), bay goby *Lepidogobius lepidus* (30.4 percent), blackeye goby *Rhinogobius nicholsi* (3.0 percent), Pacific staghorn sculpin (2.2 percent), white croaker (2.1 percent), blennies *Hypsoblennius* spp. (1.9 percent), longjaw mudsucker (1.2 percent), and Pacific herring (0.9 percent). Of the 95 percent, nearly 88 percent were represented by members of one Family—Gobiidae. This Family included the unidentified gobies, bay goby, blackeye goby, and longjaw mudsucker. Only three species of fish (Pacific herring, white croaker, and Pacific staghorn sculpin), had some commercial or recreational value, and individually represented 5 percent of the eight taxa or species.

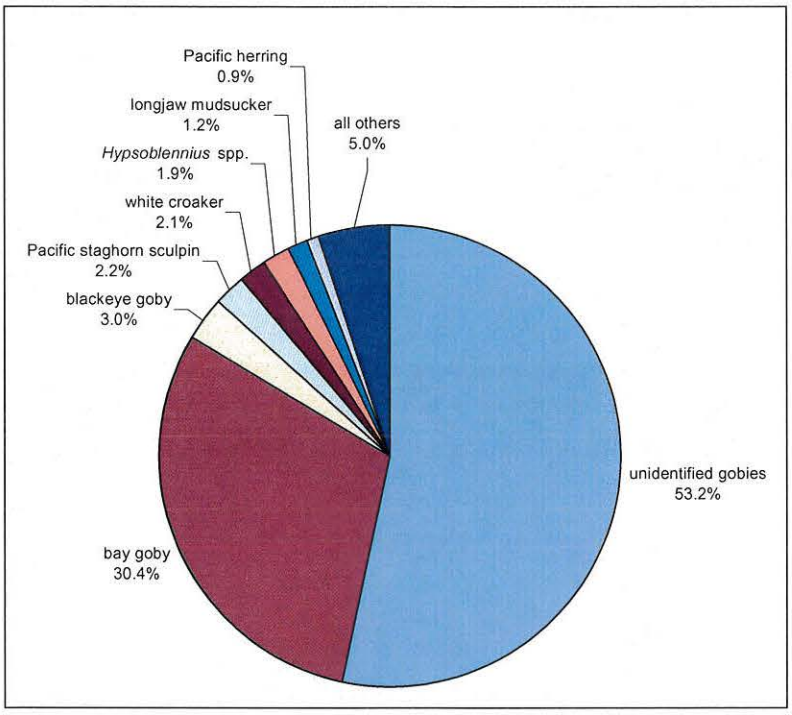

Figure 2-5. Percent composition of the most abundant larval fish taxa collected in entrainment surveys at the Moss Landing Power Plant: March 1999 through February 2000.

Low numbers (<365 individuals) of cancer crab megalops were collected in the year-long study at MLPP. Six species of cancer crab megalops were collected in entrainment surveys. Hairy rock crab comprised 29.3 percent of the total number of entrained Cancer megalops followed by yellow crab (19.6 percent), brown rock crab (19.0 percent), Dungeness crab (14.7 percent), red rock crab (9.8 percent), and slender rock crab (7.1 percent). European green crab megalops (3 individuals) were collected in only two (April 15 and April 22, 1999) entrainment surveys.

2.4.3 2005–2006 Impingement Studies

2.4.3.1 Methods

Impingement collections began on November 6, 2005 (Tenera 2007). Surveys at Units 1 & 2 were conducted over a 24-hour period once per week for the period of one year. Impingement sampling at the Units 6 & 7 occurred only if one or both of those units were scheduled to operate during any given week during the study period. Each sampling period was divided into four 6-

hour cycles. Before each weekly sampling effort, all of the screens and the bar racks (if possible) were cleaned of all impinged debris and organisms. The sluiceways and collection baskets were cleaned before the start of each sampling effort.

Samples were collected by rotating and rinsing the impinged material from the Units 1 & 2 and Units 6 & 7 (if operating) screens into collection baskets. The screens remain stationary for a period of approximately 5.5 hours then they were rotated and washed for 30 minutes. The impinged material from the traveling screens was rinsed into the collection baskets associated with each set of screens. The debris and organisms rinsed from each set of traveling screens was kept separate and processed according to the procedures presented below. Material removed by the Units 1 &2 bar rack rakes was also collected and processed. The operating status of each circulating water pump during the 6-hour cycle was recorded on the data sheet.

All fishes, decapod crabs, shrimps and prawns, cephalopod molluscs, and echinoderms collected at the end of each 6-hour cycle were identified, counted, weighed and measured. Any mutilated organisms were identified to the lowest taxonomic level possible, but their lengths were not recorded. If field personnel were unable to identify an organism, it was preserved for identification in the laboratory. The presence of other species such as jellyfish and colonial species such as bryozoans were recorded on the data sheets (Tenera 2007).

2.4.3.2 Results

Units 1 & 2

A total of 8,560 fishes were collected from the Units 1 & 2 traveling screens and bar racks; 8,527 from the traveling screens and 33 from the bar racks (Tenera 2007). Sixty-three fish taxa were collected from Units 1 & 2 traveling screens and 12 fish taxa collected from the Units 1 & 2 bar racks.

Eight taxa or species comprised 91.1 percent of the total number of fishes impinged at the Units 1 & 2 traveling screens (**Figure 2-6a**). Silversides were the most abundantly impinged fish taxa (n=2,651), comprising 31.1 percent of the total number of fishes impinged. Members of the silverside family included topsmelt, jacksmelt, California grunion *Leuresthes tenuis*, and individuals that could not be identified below the family level. Plainfin midshipman *Porichthys notatus* was the second most abundantly impinged fish comprising 15.9 percent of the total number of fishes impinged at the Units 1 & 2 traveling screens followed by pipefishes (11.4 percent), northern anchovy (9.6 percent), sanddabs *Citharichthys* spp. (9.3 percent), arrow goby (8.1 percent), threespine stickleback *Gastererosteus aculeatus* (3.1 percent), and bay goby (2.5 percent). Sanddabs included speckled sanddab and sanddabs that could not be identified to species.

The total weight of fishes impinged on the traveling screens and bar racks was 89 lb and 8 lb, respectively. Thirteen taxa or species comprised 84.4 percent of the total biomass impinged at the Units 1 & 2 traveling screens (**Figure 2-6b**). Silversides accounted for the highest biomass (33.3 percent), followed by northern anchovy (9.9 percent), Pacific staghorn sculpin (7.8

percent), plainfin midshipman (6.4 percent), cabezon (6.0 percent), Pacific electric ray *Torpedo californica* (5.6 percent), pipefishes (4.3 percent), bay goby (3.0 percent), starry flounder (2.2 percent), sanddabs (2.2 percent), California tonguefish (2.0 percent), and arrow goby (1.9 percent). On two occasions, large individual fish contributed to greater than 1 percent of the total biomass collected on the Units 1 & 2 traveling screens: green sturgeon *Acipenser medirostris* (1.9 percent), ratfish *Hydrolagus colliei* (1.5 percent).

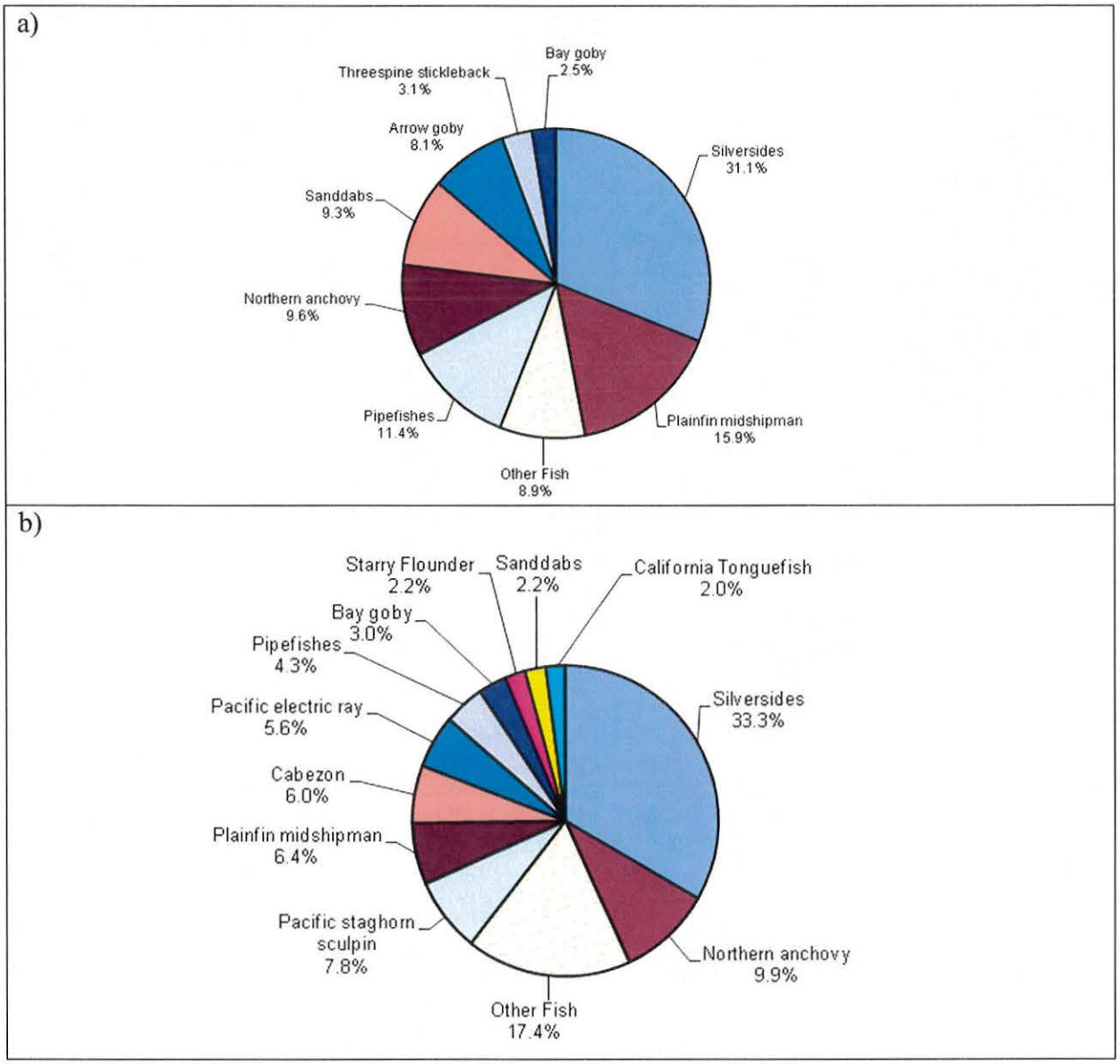

Figure 2-6. Percent composition of the most abundant fishes by a) count and b) weight in impingement surveys at the Moss Landing Power Plant Unit 1 & 2 intake: November 2006 through November 2007.

One species that is now afforded protection under the Endangered Species Act was collected at the Units 1 & 2 intake during the year-long impingement study. The southern distinct population segment (DPS) of the North American green sturgeon was listed by the National Marine Fisheries Service (NMFS) as a threatened species on July 7, 2006. The green sturgeon (21.5 inch standard length) was collected during the January 4, 2006 survey before the species was listed.

One Chinook salmon *Oncorhynchus tshawytscha* (4.8 inch SL) was collected during the August 16, 2006 survey. This specimen was examined by NMFS in Santa Cruz and it was determined that it was a hatchery-raised fish that was released in Moss Landing Harbor as part of a re-stocking program.

Units 6 & 7

A total of 20,720 fishes were collected from the Units 6 & 7 traveling screens (Tenera 2007). Fifty-three fish taxa were collected from Units 6 & 7 traveling screens. Five taxa or species comprised 90.8 percent of the total number of fishes impinged at Units 6 & 7 (**Figure 2-7a**). Northern anchovy were the most abundantly impinged fish taxa (n=16,462), comprising 79.4 percent of the total number of fishes impinged at the Units 6 & 7 intake. Silversides were the second most abundant fish impinged, comprising 5.5 percent of the total number of fishes impinged. Members of the silverside family impinged at the Units 6 & 7 intake included topsmelt, jacksmelt, and individuals that could not be identified below the family level. Sanddabs comprised 2.4 percent of the total number of fishes impinged, followed by shiner surfperch (1.8 percent), and Pacific staghorn sculpin (1.7 percent).

Nine taxa or species comprised 90.1 percent of the total biomass impinged at the Units 6 & 7 traveling screens (**Figure 2-7b**). Northern anchovy accounted for the highest biomass (53.8 percent), followed by thornback *Platyrhinoides triseriata* (9.4 percent), Pacific electric ray (7.0 percent), silversides (5.6 percent), sablefish (4.3 percent, n=5), Pacific staghorn sculpin (3.3 percent), plainfin midshipman (2.5 percent), sanddabs (2.3 percent), and English sole (1.9 percent).

Five Chinook salmon were collected at the Units 6 & 7 intake during the 2005–2006 impingement study. Two were collected during the July 6, 2006 survey (both fish measured 3.5 inch SL), one was collected during the July 12, 2006 survey (3.9 inch SL), and two were collected during the August 2, 2006 survey (4.4 inch SL). These specimens were also examined by NMFS in Santa Cruz and it was determined that they, like the specimen impinged at Units 1 & 2, were hatchery-raised fish that were released in Moss Landing Harbor as part of a re-stocking program.

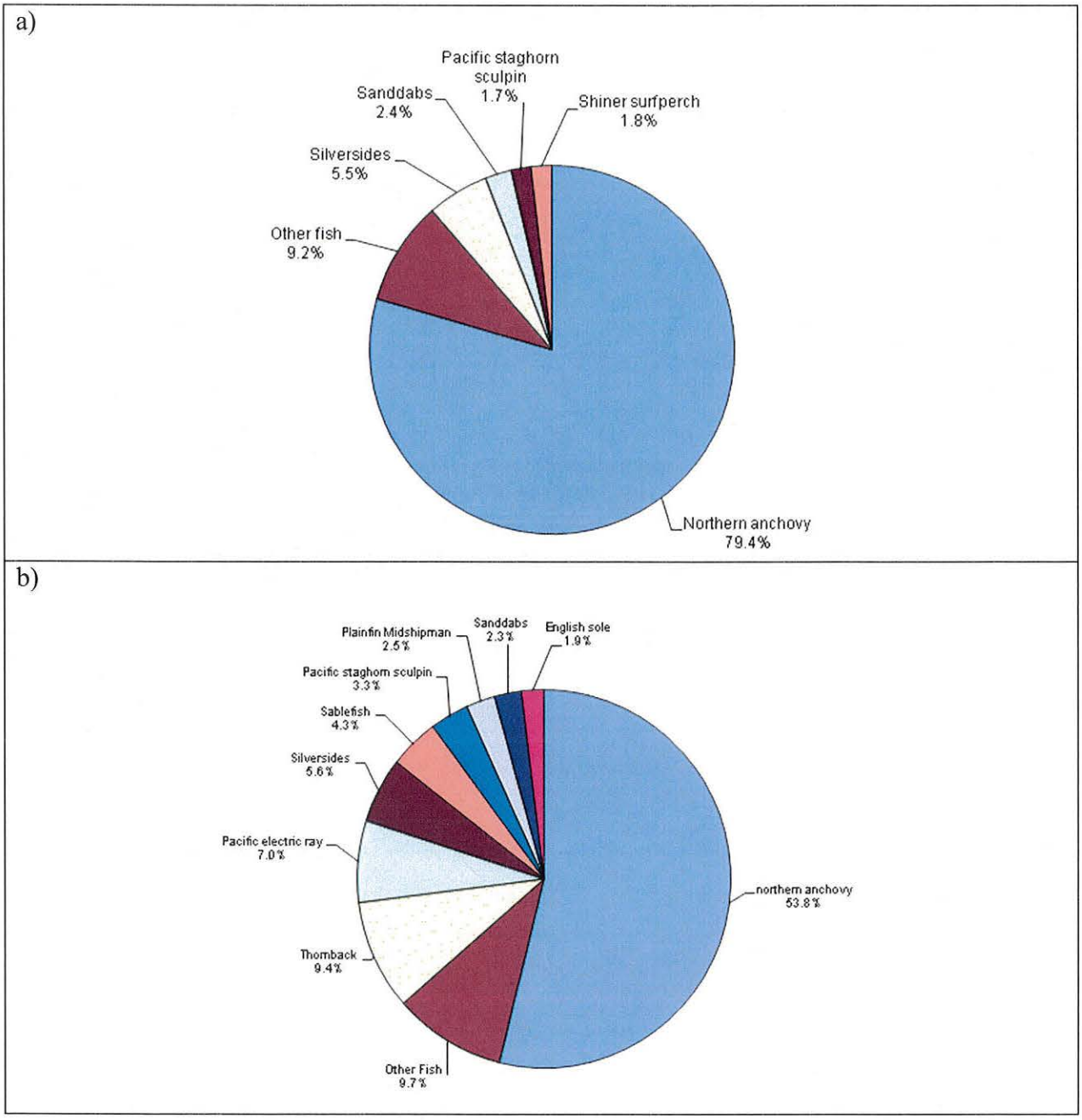

Figure 2-7. Percent composition of the most abundant fishes by a) count and b) weight in impingement surveys at the Moss Landing Power Plant Unit 6 & 7 intake: November 2006 through November 2007.

2.5 Relevance of Previous Impingement and Entrainment Studies

The Moss Landing Power Plant Modernization Project 316(b) Resource Assessment (April 2000) (MLPP 316(b) Resource Assessment)[13] and Moss Landing Power Plant Units 1&2 and Units 6&7 Impingement Study Data Report (March 2007) (MLPP Impingement Study)[14] accurately reflect current impingement and entrainment impacts of the existing MLPP intake for Units 1 and 2, with the retirement of Units 6 and 7.

The MLPP 316(b) Resource Assessment report contains the study plan, description of field and analytical methods, detailed results, and evaluation of alternative intake technologies. This study, as well as the more recent MLPP Impingement Study, was designed in a collaborative effort by scientists representing Federal and State resource and regulatory agencies and academic institutions. The Technical Working Group (TWG) scientists routinely attended meetings for the specific purpose of designing sampling plans that would accurately describe the species composition, abundance and behavior of larval fishes and shellfishes that were entrained and also found living in the facility's source water and at risk to entrainment. The statistical design of the studies also took into account the need to identify spatial and seasonal variation in these populations, particularly as might be influenced by oceanographic conditions during the course of the study. A rigorous quality assurance and control program exercised throughout the study audited the field, laboratory, and analytical methods employed during the studies.[15] Study results were routinely shared with TWG members to enable real-time review and opportunity for study plan modification. This adaptive management process facilitated the high degree of accuracy achieved in both collection and analysis of the study's entrainment and impingement data.

The entrainment study design adopted by the TWG scientists employed a method of assessing entrainment impacts that essentially eliminated traditional statistical concerns of interannual variation in larval abundance. The sampling and analytical methodology, as recognized by its acronym "ETM" (Empirical Transport Model) and described in a CEC publication,[16] has been

[13] Moss Landing Power Plant Modernization Project, 316(b) Resource Assessment (April 28, 2000), prepared for Duke Energy Moss Landing LLC by Tenera Environmental Inc.

[14] Moss Landing Power Plant Units 1&2 and Units 6&7 Impingement Study Data Report (March 2007), prepared for Moss Landing Power Plant by Tenera Environmental Inc. These impingement data replaced the impingement data in the MLPP 316(b) Resource Assessment that were collected during the 1979-1980 MLPP 316(b) study and had been used to estimate the rate of impingement until the new Units 1 and 2 intake could be constructed and impingement studied. In addition, the new impingement data replaced/reanalyzed impingement at Units 6 and 7, which had not been studied since the 1979-1980 MLPP 316(b) Study.

[15] A laboratory quality control (QC) program for all levels of laboratory sorting and taxonomic identification was applied to all samples. The QC program also incorporated the use of outside taxonomic experts to provide taxonomic QC and resolve taxonomic uncertainties.

[16] Steinbeck, J., J. Hedgepeth, P. Raimondi, G. Cailliet, and D. Mayer. Assessing Power Plant Cooling Water Intake System Entrainment Impacts, California Energy Commission Consultant Report, CEC-700-2007-010 (2007). The authors of this peer-reviewed paper were also members of the MLPP TWG, along with other agency scientists.

widely applied throughout the State by Regional Water Quality Control Boards, the CEC, the California Department of Fish and Game, the California Coastal Commission, and other State and Federal resource and regulatory agencies to assess entrainment impacts. The steady oversight of the TWG scientists throughout the course of the MLPP 316(b) Resource Assessment from study design to final report along with the project's Quality Control program assured the assessment's outcome of thorough, accurate, and purposeful findings.

The species composition of larval fish collected in the MLPP 316(b) Resource Assessment entrainment samples was mostly Harbor and slough species. The larval fishes found in the Harbor and surrounding habitat are dominated by three species of gobies that occupy mud burrows throughout the Harbor and slough's extensive intertidal and subtidal areas of shallow, soft-bottom habitat. These same species of gobies are ubiquitous in their distribution and occur in large numbers in most California bays, lagoons, and sloughs. There have not been any substantial changes in the available habitat type in Moss Landing Harbor and Elkhorn Slough since the 316(b) Resource Assessment study in 2000. As a result, the larval species composition would not be expected to have changed and the results from the study remain valid with respect to expected entrainment at the Units 1 & 2 intake.

The absence of any substantial change in the habitats in Moss Landing Harbor and Elkhorn Slough would also indicate that the same adult and juvenile fishes collected during the MLPP Impingement Study less than ten years ago would still be valid and representative at the present time due to their recent date of collection and reporting.

In short, the results of the prior studies at MLPP remain valid with respect to expected impingement and entrainment at the Units 1 & 2 intake. Therefore, Dynegy Moss Landing, LLC plans, subject to the SWRCB's approval, to use the prior studies to provide 12 months of the 36 months of baseline impingement and entrainment data.

3.0 Compliance Strategy

This section of this February 2017 Implementation Plan update identifies the compliance strategy selected for MLPP and describes the supplemental control technology and operational measures that will be undertaken to implement the alternative. A schedule for implementing those measures, as established in the Settlement Agreement, is also provided. In addition, compliance with the immediate and interim requirements under Policy section 2.C are addressed, as is the retirement of Units 6 and 7.

3.1 Track 1 is Not Feasible at MLPP

As determined by the SWRCB and set forth in the Settlement Agreement, Track 1 compliance is not feasible at MLPP.[17]

3.2 Track 2 Compliance

The Settlement Agreement (paragraph 2.1.3.) provides details on the compliance approach for MLPP under the Track 2 provisions identified in section 2.A.(2) of the Policy.

As set forth in paragraph 2.1.7.a. of the Settlement Agreement, Dynegy Moss Landing, LLC will conduct baseline studies pursuant to Policy sections 4.A.(1) and 4.B.(1) at MLPP and, no later than six months after completion of the baseline studies, shall submit a Baseline Study Report to the SWRCB for approval which shall provide: (1) results of the baseline studies for impingement and entrainment; (2) the representative species, including sensitive species, proposed to be used to determine compliance; and (3) the measured densities of the representative species by seasonal and diel periods. Following approval of the Baseline Study Report, these data will be used with data on plant cooling water flows to implement a program ("Compliance Tracking Tool") to track and demonstrate compliance with the required reductions in the Policy and the Settlement Agreement.[18]

The baseline studies will include a total of 36 months of data. As described above in Section 2.5, Dynegy Moss Landing, LLC plans to use, subject to the SWRCB's approval, previous data on entrainment and impingement as 12 of the required 36 months, and new studies which will provide the additional 24 months of data. The new studies will be designed to be compatible with the previous studies and the sampling locations for determining compliance for both Units 1 & 2

[17] See Settlement Agreement paragraph 2.1.2.–Infeasibility Demonstration. The Policy (Section 5) defines "not feasible" to mean "cannot be accomplished because of space constraints or the inability to obtain necessary permits due to public safety considerations, unacceptable environmental impact, local ordinances, regulations, etc. Cost is not a factor to be considered when determining feasibility under Track 1."

[18] *Id.*

and Units 6 & 7 will be consistent with the following: (1) entrainment may be measured at one location for the two MLPP intake structures, which are separated by approximately 800 feet, to estimate source water concentrations of fish larvae and other meroplankton during the baseline studies, and (2) the impingement monitoring for the baseline studies will occur at both intakes due to the differences in the design of the two intake structures. These and other details of the baseline studies will be described in the study design proposal to be submitted to the SWRCB (see Settlement Agreement, paragraph 2.1.3.e.).

3.2.1 Units 1 & 2

Dynegy Moss Landing, LLC will comply with the Policy using Track 2 under Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii), including application of the prior flow reduction credit provided in Policy section 2.A.(2)(d). In accordance with the Policy and the Settlement Agreement,[19] Track 2 compliance will be achieved by an 83.7% or greater reduction in impingement mortality and entrainment, pursuant to Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii).

The required Track 2 reduction in impingement mortality and entrainment may be achieved by the following:

1. Use of the prior flow reduction credit provided in Policy section 2.A.(2)(d). This credit will be applied solely to Units 1 and 2 as described below;
2. Use of operational controls to further reduce flow; and
3. Reductions in impingement mortality and entrainment through installation of technology controls.

3.2.1.1 Existing Control Measures

MLPP Units 1 & 2 currently utilize the following impingement and entrainment control measures:

- 5/16-inch mesh inclined traveling water screens;
- initial bar racks with approximately 4 inch center-to-center spacing, which provide 3½ inch wide openings between bars;
- a relocated intake structure that shortened the intake tunnel from 300 feet to approximately 20 feet; and
- operating practices for the circulating water pumps that minimize operation time of the pumps.

3.2.1.2 Flow Reduction Credit

Based on Policy section 2.A.(2)(d) and Settlement Agreement paragraph 2.1.4., the MLPP received a credit of 224 MGD by the replacement of prior Units 1–5 with combined-cycle

[19] See Settlement Agreement–Track 2 Compliance, paragraph 2.1.3.b.

Units 1 & 2. The 224 MGD credit is based on the reduction in permitted flow for the entire plant achieved through the replacement of Units 1–5. As described in Section 2.2 above, the total permitted flow for the four existing MLPP units through Discharge 002 is 1,226 MGD. This represents a reduction of 224 MGD from the combined flow through Discharge 001 and Discharge 002 of 1,450 MGD (560 and 890 MGD, respectively).

The entire 224 MGD will be credited towards compliance for Moss Landing Units 1 & 2 and subtracted from the combined actual flow for those units when calculating the levels of flow and associated levels of impingement and entrainment used in demonstrating compliance.

3.2.1.3 Track 2 Compliance Strategy

Compliance under Track 2 will be achieved by an 83.7% or greater reduction in impingement mortality and entrainment, pursuant to Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii) and Settlement Agreement paragraph 2.1.3.b. The reductions will be computed by combining the 224 MGD credit provided in Policy section 2.A.(2)(d) and Settlement Agreement paragraph 2.1.4., with the percent reduction achieved through flow control or operational measures and reductions in impingement mortality and entrainment resulting from the installation of technology controls. The percent reduction in entrainment achieved by the technology controls will be calculated based on total numbers of fish larvae and other meroplankton,[20] or calculated numbers of fish larvae and other meroplankton of a specific age or size class that have been protected from the effects of entrainment for the species selected for analysis.

The 224 MGD credit will be applied by calculating baseline levels of impingement mortality and entrainment from the data collected during previous studies at the plant and from additional data collected during the baseline studies. The impingement and entrainment rates (# and weight per cubic meter) for Units 1 & 2 measured at the sampling locations will be used to calculate annual impingement and entrainment estimates based on the design flow for Units 1 & 2 (**Table 2-1**). These estimates will provide the baseline for determining compliance. Compliance will be determined by comparing the baseline estimates with impingement and entrainment estimates calculated using actual daily flow volumes minus the 224 MGD credit. Since the entrainment and impingement survey periods through the year do not include the same number of days the adjustment for the 224 MGD credit would be applied by calculating the daily entrainment or impingement estimate based on a flow of 224 MGD and subtracting that from the daily estimate calculated using the actual flow. The reduction is calculated as follows:

$$Percentage\ Reduction = 100 - [\frac{\sum_{i=1}^{365}(Actual\ Flow\ Daily\ Estimate - 224\ MGD\ Daily\ Estimate)}{\sum_{i=1}^{365} Baseline\ \ Daily\ Estimate\ at\ 360\ MGD} \cdot 100].$$

Additional credit for flow reduction based on operational controls would be calculated using the same approach using the reduced daily flow volumes achieved through the controls in

[20] The term "fish larvae and other meroplankton" means ichthyoplankton and meroplankton as identified in the Policy at section 2.A.2.b.ii.

calculating the impingement and entrainment estimates and then applying the ratio of the total reduction to the baseline.

In accordance with the Settlement Agreement, the compliance strategy for Units 1 & 2 also includes operational measures to reduce flow. Specifically, in accordance with the Settlement Agreement paragraph 2.1.6.d, by December 31, 2016, Dynegy Moss Landing, LLC completed installation of variable speed drive (VSD) controls on four circulating water pumps for MLPP Units 1 & 2. In addition, Dynegy Moss Landing, LLC has implemented operational control measures to reduce flow, as required within 30 days after execution of the Agreement. These operational control measures include operating procedures concerning the circulating pumps to reduce pump usage during startup and shutdown.

Compliance with the required Track 2 reductions will be monitored using a Compliance Tracking System that will integrate data on impingement and entrainment with data on intake volumes to estimate the levels of impingement and entrainment. The estimates of impingement and entrainment will be compared with baseline estimates calculated using previous design flows of 360 MGD to determine the percentage reductions as shown in the above equation. The Compliance Tracking System will be used to adjust operations, as needed, to ensure compliance, including adjusting operations relative to seasonal and diel variation in larval concentrations in the source waters of the MLPP.

Reductions through the installation of technological controls will be added to the reductions achieved through the flow credit and operational controls. The calculations described above provide the flexibility to allow the additional reductions to be calculated as numbers or a percentage depending on the technology and data produced to verify the performance of the system. Operational measures and supplemental control technology that will used is identified in Section 3.3 below.

3.2.2 Units 6 & 7(Retired, December 31, 2016)

In accordance with the Settlement Agreement, Dynegy Moss Landing, LLC must comply at Units 6 & 7 under the Track 2 provisions detailed in section 2.A.(2) of the Policy no later than December 31, 2020 or cease operation of such unit(s) until such time as compliance is achieved as specified in Policy section 2.B.(2) and Settlement Agreement paragraph 2.1.6.g.[21] Dynegy Moss Landing, LLC retired Units 6&7 effective December 31, 2016.

[21] See supra note 9 and accompanying text concerning Settlement Agreement paragraph 2.1.5.

3.3 Operational Measures and Supplemental Control Technology

In accordance with Settlement Agreement paragraph 2.1.6.f., Dynegy Moss Landing, LLC must install supplemental control technology at MLPP Units 1 and 2 by December 31, 2020 to complement the operational control measures and achieve Track 2 compliance pursuant to Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii). While Units 1 & 2 are anticipated to meet the minimum 83.7% reduction in entrainment and impingement requirement through the use of operational controls, including installation of VSD controls on the circulating water pumps, and the 224 MGD credit, the March 2015 Implementation Plan provided information on several technologies that were evaluated in order to comply with the requirement for the installation of a supplemental control technology.

Dynegy Moss Landing, LLC plans to achieve Track 2 compliance for Units 1 & 2 through a combination of operational measures and installation of supplemental technology that will result in the levels of reduction in impingement and entrainment required under the Policy. As specified in the Settlement Agreement, Moss Landing Units 1 & 2 will comply with the OTC Policy by December 31, 2020. As part of the compliance approach in the Settlement Agreement, MLPP completed installation of VSD controls on four of the six circulating water pumps for Units 1 & 2 in December 2016. These VSD controlled pumps will allow for adjustment of plant intake flows to meet changes in energy demand and make adjustments during the day and during the seasons of the year when larval concentrations are high, thereby reducing entrainment. The adjustments to intake flow to reduce entrainment will be based on the Compliance Tool described in the Settlement Agreement.

The Compliance Tool model will use data currently being collected on entrainment in combination with data on intake flows to provide estimates of entrainment that can be used to adjust operations to ensure compliance with the required reductions. The baseline impingement and entrainment studies required under the Policy started in March 2015 and will continue through March 2017. The data from these studies will be combined with data collected during impingement sampling in 2005 and entrainment sampling in 2000 to provide three years of data for measuring compliance.

The entrainment sampling during both studies was conducted at a high frequency, with sampling conducted six times during each 24-hour survey. Surveys were conducted either weekly or every two weeks depending on the time of year. The frequency of entrainment sampling for the MLPP studies exceeds most other studies where sampling is usually done only two to four times a day every two to four weeks. The combined three years of data will be used in the Compliance Tool model to provide hourly estimates of entrainment for every day of the year that will be used to estimate entrainment levels. Typically, this would be done monthly to ensure that the plant is on track to maintain entrainment levels below the required levels of reduction. As allowed for in the Policy, the baseline used in measuring compliance will be the previous levels of the estimated entrainment for the Units 1–5 intake. These entrainment estimates were calculated using data

collected from studies in 1999–2001. The Settlement Agreement provides a credit of 224 MGD for use in calculating the percentage reduction in entrainment and impingement that would be applied towards meeting the 83.7% required level of reduction.

Although the MLPP is anticipated to be able to meet the required levels of reductions using operational controls and the flow credit allowed for in the Policy, the Track 2 compliance plan also includes installation of supplemental control technology that will result in further reductions in impingement and entrainment. The existing traveling water screens (TWS) at the Units 1 & 2 intake use a flexible, continuous screen that has an effective screen opening that is considerably less than standard 3/8 in. square weave mesh that is considered the baseline technology for impingement in the Federal 316(b) rule. Even though the screen face is inclined at an angle of 35 degrees, which results in a larger screen surface to reduce the through screen velocity, measurements taken at the screen surface indicate that the average through screen velocity exceeds 0.5 fps as specified in the Policy for effectively eliminating the effects of impingement. The present TWS 5/16 in. flexible, continuous screen at the intake will be changed to a mesh size that is comparable to the openings on screens with standard 3/8 in. square weave mesh. In addition, MLPP plans to coat the present TWS framework and support structures with an anti-fouling coating that will reduce the buildup of fouling organisms around the screens and intakes. The coating will also have the benefit of reducing cropping of any organisms in the vicinity of the intake. The combined screen and intake modifications will result in a reduction in through screen velocity at the intake.

The installation of new mesh size TWS and use of an anti-fouling coating are expected to result in a reduction in the through screen velocity at the intake to a design value that is very close to the 0.5 fps through screen intake velocity recognized in the Policy as sufficient to meet Track 2 for plants the rely solely on reductions in velocity to comply with the impingement mortality standard.[22] It is expected that the actual average intake velocity will be less than 0.5 fps due to the use of the VSDs to control intake volume during periods of the day and year when larval concentrations are high. As recognized in the August 2014 Federal 316(b) Rule, reductions in through screen velocity may provide benefits in reducing both impingement and entrainment. In addition, preliminary analysis of the recent MLPP impingement data shows that impingement follows a similar diel pattern as entrainment with higher levels at night, indicating that flow management using the Compliance Tool will also result in reductions in impingement that exceed the proportional reduction in flow.

The operational measures with reductions in intake volume during periods when impingement and entrainment levels are highest and installation of supplemental control technology being implemented at MLPP will ensure that Units 1 & 2 are in compliance with the required reductions in impingement and entrainment under Track 2 of the Policy by December 31, 2020.

[22] See also 40 CFR § 125.94(c)(3) (one option for complying with the Federal 316(b) rule BTA standard for impingement mortality is to operate an intake with a through screen design velocity of greater 0.5 fps at a maximum through screen velocity of 0.5 fps (or less) under all conditions).

3.3.1 Technology Verification Studies

As specified in the Settlement Agreement at paragraphs 2.1.7.c.i–iii, Dynegy Moss Landing, LLC will evaluate and report on resulting levels of entrainment and impingement following the implementation of the operational and technology controls using the Compliance Tool described in the Settlement Agreement. In addition to the reports using the Compliance Tool, MLPP will conduct flow velocity measurements at the intake on a regular basis to determine the proportion of the time that the intake is being operated at a through screen velocity of 0.5 fps or less.

3.4 Immediate and Interim Requirements in Section 2.C of the Policy

The section addresses the requirements in section 2.C. of the Policy and the related information requirements identified in the SWRCB's November 30, 2010 letter.

3.4.1 Immediate Requirements

3.4.1.1 Large Organism Exclusion Devices

Section 2.C.(1) of the Policy requires that no later than October 1, 2011, an existing power plant with an offshore intake shall install large organism exclusion devices having a distance between exclusion bars of no greater than nine inches, or install other exclusion devices, deemed equivalent by the SWRCB.

This requirement is not applicable at MLPP, which does not have an offshore intake. The intake structures for Units 1 and 2 and Units 6 and 7 are located at the east shoreline in Moss Landing Harbor.[23]

3.4.1.2 Restricting Intake Flows During Non-Operational Periods

Section 2.C.(2) of the Policy requires that no later than October 1, 2011, the owner or operator of an existing power plant unit that is not directly engaging in power-generating activities, or critical system maintenance, shall cease intake flows, unless the owner or operator demonstrates to the SWRCB that a reduced minimum flow is necessary for operations.

As provided in paragraph 2.1.7.f. of the Settlement Agreement, the SWRCB recognizes that it may be necessary to continue intake flows at MLPP even when not directly engaging in power-generating activities or critical system maintenance for short time periods while performing baseline, pilot, and/or verification studies. The Settlement Agreement (paragraph 2.1.7.f.) further

[23] The onshore intake structure for Units 1 and 2 has initial bar racks with approximately 4 inch center-to-center spacing (which provides 3½ inch wide openings between bars) that exclude, among other things, large organisms. Similarly, the onshore intake structure for Units 6 and 7 has initial bar racks with spacing between the bars at 3⅝ inches that exclude, among other things, large organisms.

provides that Dynegy Moss Landing, LLC shall include proposed testing schedules in the development of baseline, pilot and technology study plans and coordinate the study designs with the SWRCB with the goal of minimizing the impacts on the biological community from the effects of the studies. Upon SWRCB confirmation of the relevant study, Dynegy Moss Landing, LLC shall be deemed to have demonstrated to the SWRCB that a reduced minimum flow is necessary for operations pursuant to Policy section 2.C.(2). For additional information regarding intake flows during non-operational periods, see Section III.2 of the 2011 Implementation Plan, which is incorporated herein by reference.[24]

3.4.2 Interim Mitigation

As determined by the SWRCB in the Settlement Agreement (paragraph 2.1.1), the prior seven million dollar ($7,000,000.00) contribution to the Elkhorn Slough Foundation satisfies the requirements under Policy section 2.C.(3)(a) from October 1, 2015 through the December 31, 2020 final compliance date for all MLPP units.

3.5 Submittals

As provided in paragraph 2.1.6.c. of the Settlement Agreement, Dynegy Moss Landing, LLC will provide the SWRCB with an annual update on the status of measures to reduce IM&E and report the status of any studies undertaken in the previous calendar year to determine compliance options to meet Track 2.

In addition, as provided in paragraph 2.1.6.e. of the Settlement Agreement, Dynegy Moss Landing, LLC will submit, from time to time, study designs, results, and other information regarding compliance approaches and progress related to the Policy, including but not limited to the Baseline Study Design, Baseline Study Report, pilot study designs and technology verification reports. Whenever Dynegy Moss Landing, LLC submits information to the SWRCB and requests the SWRCB's confirmation or approval, the SWRCB will respond promptly with an approval or an explanation for disapproval, including any additional information needs, but in any event no later than sixty (60) days after receipt of the update. In the event the SWRCB requests additional information or other amendment, the SWRCB shall provide a decision not later than thirty (30) days after receipt of the information or amendment. These deadlines may be extended by mutual agreement. The provisions of this paragraph 2.1.6.e of the Settlement Agreement pertain only to Dynegy Moss Landing, LLC's compliance with the Policy, and do not impose obligations on the SWRCB unrelated to Dynegy's compliance with the Policy.

[24] Typical planned maintenance outages at MLPP identified in Section III.2.B.ii of the 2011 Implementation Plan also include 30-day outages every four years per unit.

3.6 Transmission Issues

See Section II.6 of the 2011 Implementation Plan, incorporated herein by reference.[25]

[25] The CAISO's 2015/2016 statewide conceptual transmission plan and information on the CAISO's 2015-2016 Regional Transmission Planning Process can be found at http://www.caiso.com/planning/Pages/TransmissionPlanning/Default.aspx. The CAISO's 2015-2016 preliminary reliability assessment study results are available at http://www.caiso.com/planning/Pages/TransmissionPlanning/2015-2016TransmissionPlanningProcess.aspx.

4.0 Compliance Schedule

In accordance with paragraphs 2.1.5 and 2.3 of the Settlement Agreement, the SWRCB undertook a public rulemaking process that resulted in an amendment to the Policy extending the compliance deadline for all four units at Moss Landing to December 31, 2020.

The Settlement Agreement contains a compliance schedule plan for MLPP (see paragraph 2.1.6.a.–g.). The schedule requires Dynegy Moss Landing, LLC to perform the following:

- within 30 days after execution of the Settlement Agreement (i.e., by November 8, 2014), submit an update to the MLPP Implementation Plan;
- within 30 days after execution of the Settlement Agreement (i.e., by November 8, 2014), implement operational control measures to reduce flow;
- beginning in 2015 by March 1 of each year, provide an annual update to the SWRCB on the status of measures to reduce IM&E and report the status of any studies undertaken in the previous calendar year to determine compliance options to meet Track 2;
- install VSD controls on the CWPs for Units 1 & 2 by December 31, 2016;
- beginning December 31, 2016 through the final compliance date of December 31, 2020, achieve 83.7% or greater reduction at MLPP in impingement mortality and entrainment from design flow using flow control and operational measures;[26]
- by the final compliance date of December 31, 2020, install supplemental control technology at Units 1 & 2 to complement the operational control measures and achieve compliance pursuant to Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii); and
- by the final compliance date of December 31, 2020 achieve compliance with Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii) at Units 6 & 7 or cease operations of such unit(s) until such time as compliance is achieved subject to Policy section 2.B.(2).

In addition, the Settlement Agreement requires Dynegy Moss Landing, LLC to conduct and submit to the SWRCB baseline studies pursuant to the Policy and evaluate technology controls by conducting a pilot study after completion of the baseline studies (see paragraph 2.1.7). A Baseline Study Report must be submitted to the SWRCB no later than six months after completion of the studies.

[26] In accordance with Settlement Agreement paragraph 2.1.6.e., percentage reductions in impingement mortality and entrainment achieved through flow control will be directly proportional to reductions in flow relative to design flow and for purposes of the provision, compliance will be determined as an annual average over the period December 31, 2016 to December 31, 2020.

5.0 Compliance Determination

For MLPP Moss Units 1 & 2, the baseline annual loss shall be calculated using estimates of density from the baseline studies multiplied by the design flow for Units 1-5 and assuming a mortality rate of 100%. The actual annual loss following implementation of operational and other measures shall be calculated as the baseline density adjusted for any applied technology multiplied by the actual plant flow and assuming an entrainment mortality of 100% and impingement mortality as adjusted by any applied technology (such as a fish return system).

After the Track 2 controls are implemented and after the December 31, 2020 final compliance date, Policy sections 4.A.(2) and 4.B.(2) specify the need for another study to confirm Track 2 compliance. For MLPP, as established in the Settlement Agreement (see paragraph 2.1.7.d.), the following provisions will satisfy the requirements of Policy sections 4.A.(2) and 4.B.(2):

i. Compliance shall be monitored utilizing a Compliance Tracking System that relies on: (1) data on the densities of representative site-specific species as approved in the Baseline Study Report, which will allow the calculation of the percent reduction in impingement mortality and entrainment; (2) actual records of cooling water flow; and (3) technology performance as verified in paragraph 2.1.7.c.iii of the Settlement Agreement.

ii. Compliance shall be determined based on the average annual reduction calculated across each NPDES permit term.

These provisions do not affect responsibilities at the end of each NPDES permit term under Policy sections 4.A.(3) and 4.B.(3).

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Attachments

A – Settlement Agreement and Release regarding Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling between State Water Resources Control Board and Dynegy, dated October 9, 2014

Attachment A: Settlement Agreement and Release

SETTLEMENT AGREEMENT AND RELEASE REGARDING WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING BETWEEN STATE WATER RESOURCES CONTROL BOARD AND DYNEGY

THIS SETTLEMENT AGREEMENT AND RELEASE ("Agreement") is entered into by and between Dynegy Moss Landing, LLC, Dynegy Morro Bay, LLC (collectively "Dynegy") and the State Water Resources Control Board ("State Water Board"), as of the last date executed below ("Execution Date"), referred to herein collectively as the "Parties" and each individually as a "Party."

RECITALS

A. WHEREAS, on May 4, 2010, the State Water Board approved Resolution 2010-0020 adopting the Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (the "Policy") and related Substitute Environmental Document ("SED") for the Policy. The State Water Board subsequently amended the Policy on October 1, 2010, July 19, 2011, and June 18, 2013. A copy of the Policy, as subsequently amended, is attached to this Agreement as Exhibit A. The Policy applies to California thermal power plants that currently use a single pass cooling system also known as once-through cooling;

B. WHEREAS, the Policy requires owners and operators of existing power plants subject to the Policy to comply with "Track 1" or "Track 2" compliance alternatives as defined in section 2 of the Policy;

C. WHEREAS, the Track 1 compliance alternative contained in Policy section 2.A.(1) specifies that the intake flow rate at each unit is to be reduced, at a minimum, to a level commensurate with that which can be attained by a closed-cycle wet cooling system. The Policy, in relevant part, identifies that reduction as a minimum 93% reduction in intake flow rate for each unit, compared to the unit's design intake flow;

D. WHEREAS, the Track 2 compliance alternative contained in Policy section 2.A.(2) is available when a plant owner or operator demonstrates that the Track 1 compliance alternative is not feasible at an existing power plant. Track 2 includes a number of provisions, but two provisions allow for monitoring to demonstrate that reductions in impingement mortality and entrainment are at a comparable level to the reductions required under Track 1. The Policy defines "comparable level" as "a level that achieves at least 90 percent of the reduction[s]" required under Track 1. As a result, Track 2 compliance can be achieved by an 83.7% or greater reduction in impingement mortality and entrainment, pursuant to Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii). The 83.7% reduction is an absolute minimum that must be achieved under Track 2's "comparable level" provisions, so plants seeking compliance pursuant to this language must be designed and operated to achieve required reductions under the Policy;

E. WHEREAS, Dynegy Moss Landing, LLC and Dynegy Morro Bay, LLC own and operate, respectively, the Moss Landing Power Plant ("Moss Landing") and the Morro Bay Power Plant ("Morro Bay"), each of which is subject to the Policy;

F. WHEREAS, the California Regional Water Quality Control Board, Central Coast Region previously issued a Federal Water Pollution Control Act ("Clean Water Act") National Pollutant Discharge Elimination System ("NPDES") permit for the operation of Moss Landing with units 1 and 2 utilizing combined-cycle technologies. As part of the Clean Water Act and related permitting associated with the construction of units 1 and 2, the facility's operator made a seven million dollar ($7,000,000.00) deposit for the benefit of the Elkhorn Slough Foundation;

G. WHEREAS, on or about October 27, 2010, Dynegy, together with four other owners and operators of power plants utilizing once-through cooling technologies, filed a Verified Petition for Writ of Mandate and Complaint for Declaratory and Injunctive Relief against the State Water Board in the Superior Court of California for the County of Sacramento (the "Court"), Case No. 34-2010-80000701 (the "Action") (as used in this Agreement, "Action" refers to Dynegy's claims against the SWRCB);

H. WHEREAS, Dynegy's claims in the Action relate to disputes over whether the State Water Board's adoption of the Policy and SED was within the State Water Board's discretion and legal authority and, in particular, whether the State Water Board's actions complied with the Clean Water Act, the Porter-Cologne Water Quality Control Act, the Administrative Procedure Act, the California Environmental Quality Act, the United States and California Constitutions, and other federal and state regulations as alleged in the Action;

I. WHEREAS, on April 1, 2011, Dynegy Moss Landing, LLC submitted, pursuant to the Policy, an Implementation Plan for Moss Landing, which documents Dynegy Moss Landing, LLC's position that compliance with Track 1 of the Policy is not feasible at Moss Landing and identifies steps that Dynegy Moss Landing, LLC will undertake to comply with the Policy, including compliance with Track 2;

J. WHEREAS, on April 1, 2011, Dynegy Morro Bay, LLC submitted, pursuant to the Policy, an Implementation Plan for Morro Bay, which documents Dynegy Morro Bay's position that compliance with Track 1 of the Policy is not feasible at Morro Bay and identifies steps that Dynegy Morro Bay, LLC will undertake to comply with the Policy, including compliance with Track 2;

K. WHEREAS, on February 5, 2014, Dynegy Morro Bay, LLC retired Morro Bay, well in advance of its December 31, 2015 final compliance date in the Policy;

L. WHEREAS, the Parties wish to compromise, resolve, settle, and terminate any and all of the disputes or claims in the Action on terms and conditions set forth herein (the "Settled Disputes and Claims");

M. WHEREAS, after extensive negotiation, the Parties have agreed upon a revision to the Policy with respect to the final compliance date for Moss Landing that the Parties support. Because the current Policy reflects a quasi-legislative exercise of power by the State Water Board, consistent with the Clean Water Act, the Porter-Cologne Act, and other applicable laws, the provisions of the Agreement pertaining to the final compliance date cannot be directly implemented, but instead must be carried out through further public proceedings of the State Water Board that are consistent with applicable laws. Only the settlement provision pertaining to the

Moss Landing final compliance date is required to go through public proceedings of the State Water Board in order to be implemented. Dynegy acknowledges that the State Water Board cannot commit to implementing the revised final compliance date proposed in this Agreement, but instead must consider all the evidence and testimony presented during further public proceedings of the State Water Board to revise the current Policy;

N. WHEREAS, the Parties represent that they understand they are waiving significant legal rights by signing this Agreement, each Party in no way concedes any positions taken in the Action, and this Agreement is made in a spirit of compromise for the sole purpose of avoiding the uncertainties and expenses of litigation with respect to the Settled Disputes and Claims;

NOW, THEREFORE, in consideration of the foregoing and the following, the Parties agree as follows:

AGREEMENT

1. Recitals Incorporated. The recitals set forth above, including all definitions therein, are expressly incorporated as terms of this Agreement.

2. Terms of Settlement.

2.1 Moss Landing Power Plant

2.1.1. Interim Mitigation. The prior seven million dollar ($7,000,000.00) contribution to the Elkhorn Slough Foundation satisfies the requirements under Policy section 2.C.(3)(a) from October 1, 2015 through the December 31, 2020 final compliance date for all Moss Landing units.

2.1.2. Infeasibility Demonstration. Track 1 is not feasible, as defined in Policy section 5, at Moss Landing under Policy section 2.A.(2) and Dynegy Moss Landing, LLC may comply pursuant to Track 2 as provided in paragraph 2.1.3, below.

2.1.3. Track 2 Compliance.

a. Dynegy Moss Landing, LLC may achieve Track 2 compliance under Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii), including application of the prior flow reduction credit provided in Policy section 2.A.(2)(d) to Moss Landing units 1 and 2.

b. Track 2 compliance can be achieved by an 83.7% or greater reduction in impingement mortality and entrainment, pursuant to Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii).

c. The required Track 2 reduction in impingement mortality and entrainment may be achieved by: (1) use of prior flow reduction credit provided in Policy section 2.A.(2)(d), calculated and applied as described below in paragraph 2.1.4 for Moss Landing units 1 and 2; (2) use of operational controls to further reduce flow; and (3) reductions in impingement mortality and entrainment through installation of technology controls, which can be calculated based on total numbers of fishes and other meroplankton.

The percent reductions in entrainment achieved by the technology controls may also be based on calculations of the numbers of fishes and other meroplankton of a specific age or size class that have been protected from the effects of entrainment for the species selected for analysis. As used in this Agreement, the term "fishes and other merorplankton" means ichthyoplankton and meroplankton as identified in the Policy at section 2.A.(2)(b)(ii).

d. Compliance with the required Track 2 reductions can be computed, after application of the credit for Moss Landing units 1 and 2, by combining the percent reduction from design flow achieved through flow control or operational measures with the reductions in impingement mortality and entrainment through the installation of technology controls, which can be calculated in accordance with paragraph 2.1.3.c.

e. The location of measurement and monitoring points will be consistent with the following: (1) entrainment may be measured at one location for the two Moss Landing intake structures, which are separated by approximately 800 feet (244 meters), to estimate source water concentrations of fishes and other meroplankton during the baseline studies, and (2) the impingement monitoring for the baseline studies will occur at both intakes due to the differences in the design of the two intake structures. These and other details of the baseline studies will be described in the study design proposal to be submitted to the State Water Board as needed.

2.1.4. Prior Reduction Credit. Moss Landing shall receive a credit for the prior reduction of 224 million gallons per day ("MGD") achieved by the replacement of prior units 1-5 with combined-cycle units 1 and 2 as provided in Policy section 2.A.(2)(d). The entire 224 MGD will be credited towards compliance for Moss Landing units 1 and 2, which may then achieve compliance with Track 2 by additional reductions in impingement mortality and entrainment to meet the required Track 2 reduction pursuant to Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii).

2.1.5. Moss Landing Compliance Date Extension. The State Water Board staff and the Parties, except the State Water Board, shall advocate to the State Water Board that it extend the final compliance date for all units at Moss Landing to December 31, 2020, using the process and procedure specified in paragraph 2.3, below.

2.1.6. Moss Landing Compliance Schedule Plan.

a. Within thirty (30) days after the Execution Date, Dynegy Moss Landing, LLC will submit an update to its Implementation Plan, previously submitted on April 1, 2011.

b. Within thirty (30) days after the Execution Date, Dynegy Moss Landing, LLC will begin implementing operational control measures to reduce flow.

c. Starting in 2015, by March 1 of each year, Dynegy Moss Landing, LLC will provide the State Water Board with an annual update on the status of (1) operational or other supplemental measures undertaken in the previous calendar year to reduce entrainment or

impingement mortality, and (2) any studies undertaken in the previous calendar year to determine compliance options to meet Track 2 requirements.

d. By December 31, 2016, Dynegy Moss Landing, LLC will install and operate variable speed drive controls on circulating water pumps serving Moss Landing units 1 and 2.

e. Beginning December 31, 2016 through the final compliance date of December 31, 2020, Dynegy Moss Landing, LLC will achieve 83.7% or greater reduction in impingement mortality and entrainment from design flow using flow control and operational measures. Percentage reductions in impingement mortality and entrainment achieved through flow control will be directly proportional to reductions in flow relative to design flow. For purposes of this provision, compliance will be determined as an annual average over the period December 31, 2016 to December 31, 2020.

f. By December 31, 2020, Dynegy Moss Landing, LLC will install supplemental control technology at Moss Landing units 1 and 2 to complement the operational control measures and achieve compliance pursuant to Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii).

g. By December 31, 2020, Dynegy Moss Landing, LLC will achieve compliance with Policy sections 2.A.(2)(a)(ii) and 2.A.(2)(b)(ii) at Moss Landing units 6 and 7 or, subject to Policy section 2.B.(2), cease operations of such unit(s) until such time as compliance is achieved.

h. Reservation of Right to Repower Moss Landing. Notwithstanding any other provision herein, Dynegy Moss Landing, LLC, reserves the right to repower Moss Landing with a technology that does not utilize once-through cooling.

2.1.7. Track 2 Studies and Compliance Determination.

a. Baseline Studies. Dynegy Moss Landing, LLC will conduct baseline studies pursuant to Policy sections 4.A.(1) and 4.B.(1) at Moss Landing to provide data to support the Compliance Tracking Tool, described below in paragraph 2.1.7.b. Dynegy Moss Landing, LLC will seek State Water Board approval of study designs for baseline studies as needed. The State Water Board shall respond promptly in accordance with the procedures described in paragraph 2.1.7.e., below.

b. Baseline Study Report. No later than six (6) months after completion of the baseline studies, Dynegy Moss Landing, LLC shall submit a Baseline Study Report to the State Water Board for approval which shall provide: (1) results of the baseline studies for impingement and entrainment; (2) the representative species, including sensitive species, proposed to be used to determine compliance; and (3) the measured densities of the representative species by seasonal and diel periods. The State Water Board shall respond promptly in accordance with the procedures described in paragraph 2.1.7.e., below. Following approval of the Baseline Study Report, these data will be used with data on plant

cooling water flows to implement a program ("Compliance Tracking Tool") to track and demonstrate compliance with the required reductions in the Policy and this Agreement.

c. Technology Evaluation and Verification. Dynegy Moss Landing, LLC will evaluate technology control(s) to be installed at Moss Landing by conducting a pilot study after completion of baseline studies and evaluation of the results of baseline studies and operational controls.

i. Dynegy Moss Landing, LLC will seek State Water Board approval of the pilot study designs as needed. The State Water Board shall respond promptly in accordance with the procedures described in paragraph 2.1.7.e., below.

ii. After completion of the pilot study, Dynegy Moss Landing, LLC will report the results to the State Water Board including: (1) specific details of the planned technology(ies) to be installed; (2) the representative site-specific species, including sensitive species, identified in the Baseline Study Report that will be used in determining compliance with Track 2 impingement mortality and entrainment reductions; and (3) an estimate of the supplemental reductions in impingement mortality and/or entrainment through installation of technology control(s), which can be calculated based on total numbers of fishes and other meroplankton. For entrainment, the percent reduction in entrainment achieved by the technology controls may also be based on calculations of the numbers of fishes and other meroplankton of a specific age or size class that have been protected from the effects of entrainment for the species selected for analysis.

iii. Upon installation of technology control(s), Dynegy Moss Landing, LLC will verify that the technology(ies) performs as expected.

d. Compliance Determination. After the Track 2 controls are implemented and after the December 31, 2020 final compliance date, Policy sections 4.A.(2) and 4.B.(2) specify the need for another study to confirm Track 2 compliance. For Moss Landing, the following provisions will satisfy the requirements of Policy sections 4.A.(2) and 4.B.(2). This provision does not affect responsibilities at the end of each NPDES permit term under Policy sections 4.A.(3) and 4.B.(3).

i. Compliance shall be monitored utilizing a Compliance Tracking Tool that relies on: (1) data on the densities of representative site-specific species as approved in the Baseline Study Report, described above, which will allow the calculation of the percent reduction in impingement mortality and entrainment[1]; (2) actual records of cooling water flow; and (3) technology performance as verified in paragraph 2.1.7.c.iii., above.

[1] For Moss Landing units 1 and 2, the baseline annual loss shall be calculated using estimates of density from the baseline studies multiplied by the design flow for units 1 through 5 and assuming a mortality rate of 100%. For Moss Landing units 6 and 7, the same calculation will be made using the design flow for those units. The actual annual loss following implementation of operational and other measures shall be calculated as the baseline density adjusted for any applied technology multiplied by the actual plant flow and assuming an entrainment mortality of 100% and impingement mortality as adjusted by any applied technology (such as a fish return system).

ii. Compliance shall be determined based on the average annual reduction calculated across each NPDES permit term.

e. Annual Updates and Other Reports and Approvals. Dynegy Moss Landing, LLC will provide the State Water Board with updates annually, as described above in paragraph 2.1.6.c., on its implementation of the Policy. In addition, Dynegy Moss Landing, LLC will submit, from time to time, study designs, results, and other information regarding compliance approaches and progress related to the Policy, including but not limited to the Baseline Study Design, Baseline Study Report, pilot study designs and technology verification reports. Whenever Dynegy Moss Landing, LLC submits information to the State Water Board and requests the State Water Board's confirmation or approval, the State Water Board will respond promptly with an approval or an explanation for disapproval, including any additional information needs, but in any event no later than sixty (60) days after receipt of the information and request. In the event the State Water Board requests additional information or other amendment, the State Water Board shall provide a decision not later than thirty (30) days after receipt of the information or amendment. These deadlines may be extended by mutual agreement. The provisions of this paragraph pertain only to Dynegy Moss Landing, LLC's compliance with the Policy, and do not impose obligations on the State Water Board unrelated to Dynegy Moss Landing's compliance with the Policy.

f. Intake Flows for Study Purposes. The State Water Board recognizes that it may be necessary to continue intake flows even when not directly engaging in power-generating activities or critical system maintenance for short time periods while performing baseline, pilot, and/or verification studies. Dynegy Moss Landing, LLC shall include proposed testing schedules in the development of baseline, pilot and technology study plans and coordinate the study designs with the State Water Board with the goal of minimizing the impacts on the biological community from the effects of the studies. Upon State Water Board confirmation of the relevant study, Dynegy Moss Landing, LLC shall be deemed to have demonstrated to the State Water Board that a reduced minimum flow is necessary for operations pursuant to Policy section 2.C.(2).

2.2 Morro Bay Power Plant.

2.2.1. Dynegy Morro Bay, LLC permanently retired Morro Bay on February 5, 2014, well in advance of its December 31, 2015 final compliance date in Table 1, section 3.E of the Policy, achieving early compliance with the Policy in consideration of the terms of this Agreement.

2.2.2. Reservation of Right to Repower Morro Bay. Notwithstanding any other provision herein, Dynegy Morro Bay, LLC, reserves the right to repower Morro Bay with a technology that does not utilize once-through cooling.

2.3 Policy Amendments to Implement Schedule Changes at Moss Landing

2.3.1. Within three (3) months of the Execution Date, the State Water Board staff shall propose a Policy amendment to change the final compliance date in Table 1, section

3.E of the Policy for all units at Moss Landing to December 31, 2020. ("Proposed Policy Amendment").

2.3.2. The State Water Board shall take action on the Proposed Policy Amendment promptly, and in any event no later than within six (6) months of the Execution Date.

2.3.3. The State Water Board staff and Dynegy shall advocate in support of the Proposed Policy Amendment by doing at least the following:

a. Preparing and submitting relevant written comments in support of the Proposed Policy Amendment;

b. Speaking in support of the Proposed Policy Amendment at any applicable hearing, workshop, or meeting held by the State Water Board to consider the amendment; and

c. By using all reasonable efforts to defend any challenge, including opposition raised in the administrative proceeding or a legal challenge brought in court, to the Proposed Policy Amendment.

2.4 NPDES Permit. Upon amendment of the Policy to extend the final compliance date for Moss Landing to December 31, 2020 following the process and procedure specified in paragraph 2.3, above, the reissuance of an NPDES permit, and its associated monitoring program, for Moss Landing will incorporate provisions necessary to implement the terms of this Agreement pertaining to Moss Landing contained in Section 2.1 and the finalized Policy amendment.

3. Implementation of Settlement.

3.1. Stay or Stipulated Dismissal without Prejudice.

3.1.1. It is the Parties' intent that Dynegy's claims in the Action shall be stayed while the Parties take the necessary actions to implement the terms of this Agreement. Further, it is the Parties' intent that, in the event of a breach of this Agreement, or in the event that the substantive terms of this Agreement are not incorporated into the NPDES permit for Moss Landing as provided in paragraph 2.4 of this Agreement, the stay of the Action will be lifted and the Action may then proceed.

a. Within twenty-one (21) days of the Execution Date, Dynegy will seek to have the Action stayed in order to allow the Parties' intentions and the terms of this Agreement to be implemented. The State Water Board will support any motion to stay the Action in accordance with this paragraph 3.1.1.

b. In the event that the Parties are unable to obtain a stay of the Action, the Parties will stipulate to dismiss the Action without prejudice and with the right of Dynegy to re-open the Action as set forth in paragraphs 3.1.1.d. and 5. The Parties shall enter this stipulation within twenty-one (21) days of being informed by the Court that it will not stay the Action. A dismissal without prejudice under this Section will serve to toll any

applicable statutes of limitation, filing, statute of repose, laches defense, claim of waiver or estoppel, or other similar defense or claim that is applicable to any of the claims or causes of action asserted by Dynegy in the Action.

c. The stay described in paragraph 3.1.1.a. or the tolling specified in paragraph 3.1.1.b. will run so long as the Parties are pursuing the necessary steps to implement the terms of this Agreement.

d. In the event that the NPDES permit for Moss Landing does not contain the provisions necessary to implement Section 2.1 of this Agreement as provided in paragraph 2.4, or to the extent that the State Water Board is otherwise in breach of this Agreement, the State Water Board stipulates that Dynegy can lift the stay, reactivate or reinstate the Action, and Dynegy can amend the original Action to include additional claims or causes of action consistent with applicable statutes of limitations. The tolling period provided by paragraph 3.1.1.b. shall not apply to additional claims or causes of action not asserted in the Action.

3.2 Dismissed with Prejudice. Upon amendment of the Policy to extend the final compliance date for Moss Landing to December 31, 2020 and the reissuance of an NPDES permit to Moss Landing that adopts the provisions of the Policy and this Agreement, Dynegy will file a voluntary dismissal of the Action with prejudice, or if the Action has already been dismissed pursuant to paragraph 3.1.1.b., then Dynegy shall not be entitled to reopen or reinstate the claims or causes of action contained in the Action and those claims are subject to the release of paragraph 3.3.

3.3 Release. Upon the conditions of paragraph 3.2, Dynegy fully and forever releases the State Water Board from any and all claims, demands, actions, causes of action, obligations, damages, liabilities, loss, costs or expense, including attorneys fees, of any kind or nature whatsoever, in law, equity or otherwise, which it may now have as a result of the adoption of the Policy and the Proposed Policy Amendment. The release provided by this paragraph does not extend to any subsequent actions of the State Water Board that modify the Policy in a way that imposes additional obligations on Dynegy or any subsequent action by the State Water Board that is in breach of this Agreement.

4. Effect on State Water Board Authorities. Except as specifically agreed to herein, nothing in this Agreement limits the authority of the State Water Board to exercise its powers provided under state and federal law, including to issue or enforce orders.

5. Default and Remedies. In the event of an alleged breach, the non-breaching Party agrees to give written notice of the alleged breach to all other Parties and to consult with the Parties within fifteen (15) days of the written notice of the alleged breach, unless otherwise agreed in writing, for the purpose of attempting in good faith to resolve any disputes prior to the initiation of litigation or court proceedings. If the Parties are unable to resolve the dispute, the non-breaching Party can move to re-open the Action, and can amend the original Action to include a claim for breach of this Agreement.

6. Attorneys Fees and Costs. All Parties agree to bear their own fees and costs associated with the Action or any challenges by any non-party to this Agreement and related implementing documents and processes.

7. Superior Court to Enforce Agreement. The Parties agree and acknowledge that this Agreement shall be deemed to have been entered into by and between the Parties in the County of Sacramento, State of California. The Parties agree that the Superior Court of California for the County of Sacramento, in which forum the Action was filed, shall be the judicial forum for purposes of jurisdiction should any Party seek to enforce the terms of this Agreement.

8. No Admission. This Agreement and its provisions and any proceedings taken hereunder are for settlement purposes only and are not intended to be, and shall not in any event be construed or deemed to be, an admission or concession on the part of the Parties, or any of them, of any liability or wrongdoing whatsoever. This Agreement is predicated upon unique facts which exist between the Parties and none of the Parties intend this Agreement to be a waiver of any right or position in regards to any third party. Neither this Agreement nor any negotiations or proceedings in pursuance of this Agreement shall be offered or received in any action or proceeding as an admission or concession of liability or wrongdoing of any nature on the part of the Parties, or any of them, or anyone acting on their respective behalves.

9. Successors. This Agreement shall be binding upon and inure to the benefit of the Parties hereto and their respective representatives, successors and assigns. No Party may assign its rights under this Agreement without the prior written consent of the other Parties.

10. No Third Party Beneficiaries. This Agreement is between the Parties and is not intended to confer upon any person other than the Parties any rights or remedies.

11. Notices. All communications and notices to be given to any Party under this Agreement shall be sufficiently given for purposes hereunder if in writing and delivered by hand, courier or overnight delivery service, or certified or registered mail return receipt requested with appropriate postage prepaid, with an additional copy provided by electronic mail, and directed to the addresses below:

As to State Water Board:

Michael A.M. Lauffer, Chief Counsel
State Water Resources Control Board
1001 I Street, 22nd Floor
Sacramento, CA 95814
michael.lauffer@waterboards.ca.gov

As to Dynegy:

Elizabeth P. Ewens, Esq.
Ellison, Schneider & Harris L.L.P
2600 Capitol Avenue, Suite 400
Sacramento, CA 95816
epe@eslawfirm.com

and

Dynegy Moss Landing, LLC and Dynegy Morro Bay, LLC
601 Travis Street, Suite 1400
Houston, TX 77002
Attention: General Counsel
Catherine.Callaway@dynegy.com

11.1 Any Party may change its notice recipient or address for providing notice to it by notifying the other Party(ies) in writing setting forth such new notice recipient or address.

12. Further Cooperation. The Parties, and each of them, agree to do all things reasonably necessary to implement this Agreement, including, but not limited to, executing such additional writings as may be reasonably required to carry out the intent of this Agreement. The Parties will reasonably cooperate, each with the other, to effectuate the purpose of this Agreement, to protect and defend its integrity and do what may be necessary to verify its existence and operation in such matters as may be relevant.

13. Entire Agreement. This Agreement constitutes the entire agreement between the Parties. There are no further or other agreements or understandings, written or oral, in effect between the Parties relating to the subject matter of this Agreement.

14. Modification of Agreement. It is expressly understood and agreed that this Agreement may not be altered, amended, modified, or otherwise changed in any respect whatsoever except by a writing duly executed by authorized representatives of the Parties hereto. The Parties hereby agree and acknowledge that they will make no claim at any time or place that this Agreement has been orally altered or modified or otherwise changed by oral communication of any kind or character.

15. Mutual Preparation. The Parties each cooperated in the drafting and preparation of this Agreement and thus it shall be deemed drafted by all Parties to the Agreement. The language of all parts of this Agreement shall be construed as a whole, according to its fair meaning, and not strictly for or against any Party as the drafter thereof.

16. Authority. Each Party respectively represents and warrants to each other Party that the undersigned representative for such Party has full and complete authority to execute and enter into this Agreement and bind said Party to the terms hereof.

17. Counterparts. This Agreement may be executed by facsimile and in counterparts, and each counterpart shall be considered an original, and all of which, taken together, shall constitute one and the same instrument; provided, however, that original signatures will also be provided to all counsel by mail.

18. Captions. The captions contained herein are intended solely for convenience and shall not be construed as full or accurate descriptions of the terms hereof.

19. Independent Investigation. Each Party has made such investigation of the facts pertaining to this Agreement and of all matters pertaining thereto as it deems necessary.

20. Governing Law. This Agreement has been executed and delivered in the State of California and its validity, interpretation, performance, and enforcement shall be governed by the laws of the State of California.

21. Severability. If any portion or portions of this Agreement are held by a court of competent jurisdiction to conflict with any federal, state, or local laws, and as a result such portion or portions are declared to be invalid and of no force or effect in such jurisdiction, all remaining portions of this Agreement shall otherwise remain in full force and effect and be construed as if such invalid portions had not been included herein.

22. Force Majeure. No Party to this Agreement shall be deemed in violation of it if it is prevented from performing any of the obligations hereunder by reason of boycotts, labor disputes, embargoes, shortage of material, act of God, strikes, lockouts, labor troubles, inability to procure labor or materials, fire, accident, laws or regulations of general applicability, act of superior governmental authority, weather conditions, sabotage, or any other cause or circumstances for which it is not responsible and beyond its control (financial inability excepted). Any Party intending to assert force majeure shall notify the other Party(ies) in writing as soon as practicable following the date the Party first knew, or by the exercise of reasonable diligence should have known, of the force majeure event.

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23. Voluntary and Knowing Execution. Each Party respectively represents and warrants to each other Party that it has thoroughly read and considered all aspects of this Agreement, that it understands all provisions of this Agreement, that it has had the opportunity to consult with counsel, and that it is voluntarily and knowingly entering into this Agreement without duress or coercion of any kind.

SO AGREED:

Dated: ~~September~~ October 9, 2014

STATE WATER RESOURCES CONTROL BOARD

By: _____
Thomas Howard,
Executive Director

Dated: September ____, 2014

DYNEGY MOSS LANDING, LLC

By: _____
Robert C. Flexon
President and Chief Executive Officer
Dynegy Moss Landing, LLC

Dated: September ____, 2014

DYNEGY MORRO BAY, LLC

By: _____
Robert C. Flexon
President and Chief Executive Officer
Dynegy Morro Bay, LLC

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SO AGREED:

Dated: September ____, 2014 STATE WATER RESOURCES CONTROL BOARD

By: _____
Thomas Howard,
Executive Director

Dated: ~~September~~ October 8, 2014 DYNEGY MOSS LANDING, LLC

By: Matthew W Dalley
~~Robert C. Flexon~~ Matthew W. Dalley
~~President and Chief Executive Officer~~ Vice President + General Mgr
Dynegy Moss Landing, LLC

Dated: ~~September~~ October 8, 2014 DYNEGY MORRO BAY, LLC

By: Matthew W. Dalley
~~Robert C. Flexon~~ Matthew W. Dalley
~~President and Chief Executive Officer~~ Vice President + General Mgr.
Dynegy Morro Bay, LLC

APPENDIX A
PROPOSED AMENDMENT TO THE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING

1. Introduction

   A. Clean Water Act Section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impact. Section 316(b) is implemented through National Pollutant Discharge Elimination System (NPDES) permits, issued pursuant to Clean Water Act Section 402, which authorize the point source discharge of pollutants to navigable waters.

   B. The State Water Resources Control Board (State Water Board) is designated as the state water pollution control agency for all purposes stated in the Clean Water Act.

   C. The State Water Board and Regional Water Quality Control Boards (Regional Water Boards) (collectively Water Boards) are authorized to issue NPDES permits to point source dischargers in California.

   D. Currently, there are no applicable nationwide standards implementing Section 316(b) for *existing power plants**[1]. Consequently, the Water Boards must implement Section 316(b) on a case-by-case basis, using best professional judgment.

   E. The State Water Board is responsible for adopting state policy for water quality control, which may consist of water quality principles, guidelines, and objectives deemed essential for water quality control.

   F. This Policy establishes requirements for the implementation of Section 316(b), using best professional judgment in determining BTA for cooling water intake structures at existing coastal and estuarine power plants that must be implemented in NPDES permits.

   G. The intent of this Policy is to ensure that the beneficial uses of the State's coastal and estuarine waters are protected while also ensuring that the electrical power needs essential for the welfare of the citizens of the State are met. The State Water Board recognizes it is necessary to develop replacement infrastructure to maintain electric reliability in order to implement this Policy and in developing this policy considered costs, including costs of compliance, consistent with state and federal law.

[1] An asterisk indicates that the term is defined in Section 5 of the Policy.

H. During the development of this Policy, State Water Board staff has met regularly with representatives from the California Energy Commission (CEC), California Public Utilities Commission (CPUC), California Coastal Commission (CCC), California State Lands Commission (SLC), California Air Resources Board (ARB), and California Independent System Operator (CAISO) to develop realistic implementation plans and schedules for this Policy that will not cause disruption in the State's electrical power supply. The compliance dates for this Policy were developed considering a report produced by the energy agencies (CEC, CPUC, and CAISO), titled "Implementation of OTC Mitigation Through Energy Infrastructure Planning and Procurement Changes", and the accompanying table, titled "Draft Infrastructure Replacement Milestones and Compliance Dates for Existing Power Plants in California Using Once Through Cooling (OTC)", included in the Substitute Environmental Document for this Policy. The energy agencies' approach seeks to address the replacement, repowering, or retirement of power plants currently using OTC that (1) maintains reliability of the electric system; (2) meets California's environmental policy goals; and (3) achieves these goals through effective long-term planning for transmission, generation and demand resources. The energy agencies have stated that the dates specified in their report may require periodic updates.

I. To prevent disruption in the State's electrical power supply when the Policy is implemented, the State Water Board will convene a Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS), which will include representatives from the CEC, CPUC, CAISO, CCC, SLC, ARB, and State Water Board. SACCWIS will review implementation plans and schedules submitted by dischargers pursuant to this Policy, and advise the State Water Board on the implementation of this Policy to ensure that the implementation schedule takes into account local area and grid reliability, including permitting constraints. The State Water Board recognizes the compliance dates in this Policy may require amendment based on, among other factors, the need to maintain reliability of the electric system as determined by the energy agencies included in the SACCWIS, acting according to their individual or shared responsibilities. The State Water Board retains the final authority over changes to the adopted policy.

J. While the CEC, CPUC and CAISO each have various planning or permitting responsibilities important to this effort, the approach relies upon use of competitive procurement and forward contracting mechanisms implemented by the CPUC in order to identify low cost solutions for most OTC power plants. The CPUC has authority to order the investor-owned utilities (IOUs) to procure new or repowered fossil-fueled generation for system and/or local reliability in the Long-Term Procurement Plan (LTPP) proceeding. In response to the Policy, the CPUC anticipates modifying its LTPP proceeding and procurement processes to require the IOUs to assess replacement infrastructure needs and conduct targeted requests for offers (RFOs) to acquire replacement, repowered or otherwise compliant generation capacity. LTPP proceedings are conducted on a biennial cycle and plans are normally approved in odd-numbered years. The

next cycle, the 2010 LTPP, is estimated to result in a decision by 2011. The subsequent cycle, the 2012 LTPP, would in turn result in a decision by 2013. Once authorized to procure by a CPUC LTPP decision, the IOUs need approximately 18 months to issue an RFO, sign contracts, and submit applications to the CPUC for approval. Approval by the CPUC takes approximately nine months. If the contract involves a facility already licensed through the CEC generation permitting process, then financing and construction can begin. A typical generation permitting timeline is 12 months, but specific issues such as ability to obtain air permits can delay the process. IOUs often give preference to RFO bids with permits already (or nearly) in place. From contract approval, construction usually takes three years, if generation permits are approved, or approximately five years, if generation permits are pending or other barriers present delays. In total, starting from the initiation of an LTPP proceeding (2010 LTPP or 2012 LTPP), seven years are expected to elapse, before replacement infrastructure is operational. Due to the number of plants affected, efforts to replace or repower OTC power plants would need to be phased.

K. Because the Los Angeles region presents a more complex and challenging set of issues, it is anticipated that more time would be needed to study and implement replacement infrastructure solutions. Therefore, total elapsed time is expected to begin in 2010 and end in 2017 for the Greater Bay Area and San Diego regions, which would be addressed beginning in the 2010 LTPP. For the Los Angeles region, which would be addressed beginning in the 2012 LTPP, total elapsed time is expected to begin in 2012 and end in 2020. A transmission solution is expected to have approximately the same timeframe, but could be delayed by greater potential for significant local opposition. In order to assure that repowering or *new power plant** development in the Los Angeles basin addresses unique permitting challenges, the SACCWIS will assist the State Water Board in evaluating schedules for power plants not under the jurisdiction of the CPUC or operating within the CAISO Balancing Authority Area.

L. The Global Warming Solutions Act of 2006 requires California to reduce greenhouse gas emissions to 1990 levels by 2020 and then to maintain those reductions. California presently has two *nuclear-fueled power plants** that provide approximately 4,600 megawatts of baseload electricity and do not emit greenhouse gases during energy generation. Energy generation by facilities that do not emit greenhouse gases will be critical to meeting the mandates of the Global Warming Solutions Act and emerging national and international greenhouse gas reduction requirements. The *nuclear-fueled power plants** are entering into United States Nuclear Regulatory Commission (Commission) license renewal proceedings unique to the nuclear power industry and relicensing may extend the plants operating lives to approximately 2045. Unlike older era fossil-fueled plants, if the *nuclear-fueled power plants** undergo modernization as part of relicensing or cooling structure upgrades, that modernization will not reduce greenhouse gas emissions, and in fact, extended

downtime during modernization may result in short-term increases in greenhouse gases as other greenhouse gas emitting facilities provide makeup power. In recognition of these considerations and others, this Policy requires special studies for the *nuclear-fueled power plants** to address their unique issues, and to evaluate appropriate requirements for those plants.

M. To conserve the State's scarce water resources, the State Water Board encourages the use of recycled water for cooling water in lieu of marine, estuarine or fresh water.

N. The Regional Water Boards are responsible for all NPDES permit actions for *existing power plants** subject to this Policy, including without limitation actions to issue, modify, reissue, revoke, and terminate NPDES permits after October 1, 2010. In order to ensure a high level of statewide consistency in implementing Section 316(b), the State Water Board Division of Water Quality (DWQ) staff will provide technical support in all issues related to implementation of the OTC Policy.

O. Nothing in this Policy precludes the authority of the State Water Board and the Regional Water Board to regulate discharges from *existing power plants** through NPDES permits, consistent with water quality standards.

2. Requirements for *Existing Power Plants**

A. Compliance Alternatives. An owner or operator of an *existing power plant** must comply with either Track 1 or Track 2, below.

(1) Track 1. An owner or operator of an *existing power plant** must reduce *intake flow rate** at each unit, at a minimum, to a level commensurate with that which can be attained by a *closed-cycle wet cooling system**. A minimum 93 percent reduction in *intake flow rate** for each unit is required for Track 1 compliance, compared to the unit's design *intake flow rate**. The through-screen intake velocity must not exceed 0.5 foot per second. The installation of closed cycle dry cooling systems meets the intent and minimum reduction requirements of this compliance alternative.

(2) Track 2. If an owner or operator of an *existing power plant** demonstrates to the State Water Board's satisfaction that compliance with Track 1 is *not feasible**, the owner or operator of an *existing power plant** must reduce impingement mortality and entrainment of marine life for the facility, on a unit-by-unit basis, to a comparable level to that which would be achieved under Track 1, using operational or structural controls, or both.

(a) Compliance for impingement mortality shall be determined either:

(i) For plants relying solely on reductions in velocity, by monthly verification of through-screen intake velocity not to exceed 0.5 foot per second, or

(ii) By monitoring required in Section 4.A, below. For measured reductions determined by monitoring, the owner or operator must reduce impingement mortality to a comparable level to that which would be achieved under Track 1. A "comparable level" is a level that achieves at least 90 percent of the reduction in impingement mortality required under Track 1.

(b) Compliance for entrainment shall be determined either:

(i) For plants relying solely on reductions in flow, by recording and reporting reductions in terms of monthly flow, in which case a minimum of 93% reduction in flow, as compared to the average actual flow for the corresponding months from 2000 – 2005, must be met, or

(ii) For plants relying in whole or in part on other control technologies (e.g., including but not limited to screens or re-location of intake structures), by measured reductions in entrainment determined by monitoring required in Section 4.B, below. The owner or operator must reduce entrainment to a comparable level to that which would be achieved under Track 1. A "comparable level" is a level that achieves at least 90 percent of the reduction in entrainment required under Track 1. If screens are employed to reduce entrainment, compliance shall be determined based on *ichthyoplankton**, and on the crustacean phyllosoma and megalops larvae, and squid paralarvae fractions of *meroplankton**.

(c) Technology-based improvements that are specifically designed to reduce impingement mortality and/or entrainment and were implemented prior to October 1, 2010 may be counted towards meeting Track 2 requirements.

(d) The owner or operator of an *existing power plant** with *combined-cycle power-generating units** installed prior to October 1, 2010 may achieve compliance in accordance with this paragraph.

The owner or operator may count prior reductions in impingement mortality and entrainment resulting from the replacement of steam turbine power-generating units with *combined-cycle power-generating units**, towards meeting Track 2 requirements. Reductions shall be based on reductions in intake flows, calculated as the difference between:

(i) the maximum permitted discharge (expressed as million gallons per day (MGD)) for the entire power plant as identified in the plant's prior NPDES permit that authorized the steam turbine power-generating units which were subsequently replaced with the *combined-cycle power-generating units** and

(ii) the maximum permitted discharge (expressed as MGD) for the entire power plant, including the combined cycle units, as identified in the plant's NPDES permit authorizing the *combined-cycle power-generating units**.

B. Final Compliance Dates

(1) *Existing power plants** shall comply with Section 2.A, above, as soon as possible, but no later than, the dates shown in Table 1, contained in Section 3.E, below.

(2) Based on the need for continued operation of an *existing power plant** to maintain the reliability of the electric system, a final compliance date may be suspended under the following circumstances:

(a) **Suspension of Final Compliance Date for Less Than 90 Days for *Existing Power Plants** Within CAISO Jurisdiction.** If CAISO determines that continued operation of an *existing power plant** is necessary to maintain the reliability of the electric system in the short-term, CAISO shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant**, and the SACCWIS. If the Executive Directors of the CEC and CPUC do not object in writing within 10 days to CAISO's written notification, the notification provided pursuant to this paragraph will suspend the final compliance date for the shorter of 90 days or the time CAISO determines necessary to maintain reliability. In the event either CEC or CPUC objects as provided in this paragraph, then the State Water Board shall hold a hearing as expeditiously as possible to determine whether to suspend the compliance date in accordance with paragraph (d).

(b) **Suspension of Final Compliance Date for Longer Than 90 Days, or consecutive less than 90 day suspensions, for *Existing Power Plants** Within CAISO Jurisdiction.** If CAISO determines that continued operation of an *existing power plant** is necessary to maintain the reliability of the electric system, CAISO shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant**, and the SACCWIS. If the Executive Directors of the CEC and CPUC do not object in writing within 10 days to CAISO's determination, the notification provided pursuant to this paragraph will suspend the final compliance date for 90 days. During the 90-day time suspension or within 90 days of receiving a written notification from

CAISO, the State Water Board shall conduct a hearing in accordance with paragraph (d) to determine whether to suspend the final compliance date for more than the original 90 days pending, if necessary, full evaluation of amendments to final compliance dates contained in the policy.

(c) **Suspension of Final Compliance Date for *Existing Power Plants** Within Los Angeles Department of Water and Power (LADWP) Service Area.** If the LADWP Commission determines, through a public process, that continued operation of an *existing power plant** operated by LADWP is necessary to maintain the reliability of the electric system in the short-term, LADWP shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant**, and the SACCWIS. Within 45 days of receiving a written notice from LADWP, the State Water Board shall conduct a hearing in accordance with paragraph (d) to determine whether to suspend the final compliance date. In considering whether to suspend or amend the final compliance dates the State Board shall consult with the CAISO.

(d) **State Water Board Hearings on Suspension of Final Compliance Dates.** In considering whether to suspend or amend the final compliance dates, the State Water Board shall afford significant weight to the recommendations of the CAISO.

C. Immediate and Interim Requirements

(1) No later than October 1, 2011, the owner or operator of an *existing power plant** with an *offshore intake** shall install large organism exclusion devices having a distance between exclusion bars of no greater than nine inches, or install other exclusion devices, deemed equivalent by the State Water Board.

(2) No later than October 1, 2011, the owner or operator of an *existing power plant** unit that is not directly engaging in *power-generating activities**, or *critical system maintenance**, shall cease intake flows, unless the owner or operator demonstrates to the State Water Board that a reduced minimum flow is necessary for operations.

(3) The owner or operator of an *existing power plant** must implement measures to mitigate the interim impingement and entrainment impacts resulting from the cooling water intake structure(s), commencing October 1, 2015 and continuing up to and until the owner or operator achieves final compliance. The owner or operator must include in the implementation plan, described in Section 3.A below, the specific measures that will be undertaken to comply with this requirement. An owner or operator may comply with this requirement by:

(a) Demonstrating to the State Water Board's satisfaction that the owner or operator is compensating for the interim impingement and entrainment impacts through existing mitigation efforts, including any projects that are required by state or federal permits as of October 1, 2010; or

(b) Demonstrating to the State Water Board's satisfaction that the interim impacts are compensated for by the owner or operator providing funding to the California Coastal Conservancy which will work with the California Ocean Protection Council to fund an appropriate *mitigation project**; or

(c) Developing and implementing a *mitigation project** for the facility, approved by the State Water Board, which will compensate for the interim impingement and entrainment impacts. Such a project must be overseen by an advisory panel of experts convened by the State Water Board.

(d) The *habitat production foregone** method, or a comparable alternate method approved by the State Water Board , shall be used to determine the habitat and area, based on replacement of the annual entrainment, for funding a *mitigation project**.

(e) It is the preference of the State Water Board that funding is provided to the California Coastal Conservancy, working with the California Ocean Protection Council, for mitigation projects directed toward increases in marine life associated with the State's Marine Protected Areas in the geographic region of the facility.

(4) Owners or operators of fossil fueled units that have submitted implementation plans to comply with this Policy under Section 2.A(1) and have requested compliance dates after December 31, 2022 that are approved by the State Water Board as provided in Section 3.E shall:

(a) Commit to eliminate OTC and seawater use for cooling water purposes for all units at the facility.

(b) Conduct a study or studies, singularly or jointly with other facilities, to evaluate new technologies or improve existing technologies to reduce impingement and entrainment.

(c) Submit the results of the study and a proposal to minimize entrainment and impingement to the Chief Deputy Director no later than December 31, 2015.

(d) Upon approval of the proposal by the Chief Deputy Director, complete implementation of the proposal no later than December 31, 2020.

D. *Nuclear-Fueled Power Plants**

If the owner or operator of an existing *nuclear-fueled power plant** demonstrates that compliance with the requirements for *existing power plants** in Section 2.A, above, of this Policy would result in a conflict with any safety requirement established by the Commission, with appropriate documentation or other substantiation from the Commission, the State Water Board will make a site-specific determination of best technology available for minimizing adverse environmental impact that would not result in a conflict with the Commission's safety requirements. The State Water Board may also establish alternative, site-specific requirements in accordance with Section 3.D (8).

3. Implementation Provisions

A. With the exception of *nuclear-fueled power plants**, which are covered under 3.D, below, no later than April 1, 2011, the owner or operator of an *existing power plant** shall submit an implementation plan to the State Water Board.

(1) The implementation plan shall identify the compliance alternative selected by the owner or operator, describe the general design, construction, or operational measures that will be undertaken to implement the alternative, and propose a realistic schedule for implementing these measures that is as short as possible. If the owner or operator chooses to repower the facility to reduce or eliminate reliance upon OTC, or to retrofit the facility to implement either Track 1 or Track 2 alternatives, the implementation plan shall identify the time period when generating power is infeasible and describe measures taken to coordinate this activity through the appropriate electrical system balancing authority's maintenance scheduling process.

(2) If the owner or operator selects *closed-cycle wet cooling** as a compliance alternative, the owner or operator shall address in the implementation plan whether recycled water of suitable quality is available for use as makeup water.

B. The SACCWIS shall be impaneled no later than January 1, 2011, by the Executive Director of the State Water Board, to advise the State Water Board on the implementation of this Policy to ensure that the implementation schedule takes into account local area and grid reliability, including permitting constraints. SACCWIS shall include representatives from the CEC, CPUC, CAISO, CCC, SLC, ARB, and State Water Board.

(1) SACCWIS meetings shall be scheduled regularly and as needed. Meetings shall be open to the public and shall be noticed at least 10 days in advance of the meeting. All SACCWIS products shall be made available to the public.

(2) The SACCWIS shall review the owner or operator's proposed implementation schedule and report to the State Water Board with recommendations no later than October 1, 2011. The SACCWIS may consult with other appropriate agencies, including but not limited to the Regional Water Boards, air quality districts, and the LADWP, in the process of reviewing implementation schedules and providing recommendations to the State Water Board.

(3) The CAISO and the LADWP shall each submit to the SACCWIS by December 31, each year a grid reliability study, for their respective jurisdictions, that has been developed pursuant to a public process and approved by their governing bodies. In order to assure that SACCWIS can provide annual reports to the State Water Board by March 31, the SACCWIS shall promptly meet to consider the reliability studies submitted by CAISO and the LADWP.

(4) The SACCWIS will report to the State Water Board with recommendations on modifications to the implementation schedule every year starting in 2012. If members of SACCWIS do not believe the full committee recommendations reflect their concerns they may issue minority recommendations that the State Water Board shall consider as part of the SACCWIS recommendations.

(5) The State Water Board shall consider the SACCWIS' recommendations and direct staff to make modifications, if appropriate, for the State Water Board's consideration. In the event that the SACCWIS energy agencies (CAISO, CPUC, and CEC) make a unanimous recommendation for implementation schedule modification based on grid reliability, the State Water Board shall afford significant weight to the recommendation.

C. The Regional Water Board shall reissue or, as appropriate, modify NPDES permits issued to owners or operators of *existing power plants**, after a hearing in the affected region, to ensure that the permits conform to the provisions of this Policy.

(1) The permits shall incorporate a final compliance schedule that requires compliance no later than the due dates contained in Table 1, contained in Section 3.E, below. If the State Water Board determines that a longer compliance schedule is necessary to maintain reliability of the electric system per SACCWIS recommendations while other OTC power plants are retrofitted, repowered, or retired or transmission upgrades take place, this delay shall be incorporated into the compliance schedule and stated in the permit findings.

(2) The Regional Water Board shall reopen, if necessary, the relevant permits and modify the final compliance schedules, if appropriate, based on modifications to the policy approved by the State Water Board or the suspension of final compliance dates pursuant to this policy.

(3) If an owner or operator selects Track 2 as the compliance alternative, the NPDES permit shall include a monitoring program that complies with Section 4 of this Policy.

(4) NPDES permits issued by the Regional Water Board shall include appropriate permit provisions to implement suspensions of final compliance dates authorized in Section 2.B (2) and modifications to final compliance dates specified in this policy, without reopening the permits.

D. No later than January 1, 2011 the Executive Director of the State Water Board, using the authority under section 13267(f) of the Water Code, shall request that Southern California Edison (SCE) and Pacific Gas & Electric Company (PG&E) conduct special studies for submission to the State Water Board.

(1) The special studies shall investigate alternatives for the *nuclear-fueled power plants** to meet the requirements of this Policy, including the costs for these alternatives.

(2) The special studies shall be conducted by an independent third party with engineering experience with nuclear power plants, selected by the Executive Director of the State Water Board.

(3) The special studies shall be overseen by a Review Committee, established by the Executive Director of the State Water Board no later than January 1, 2011, which shall include, at a minimum, representatives of SCE, PG&E, SACCWIS, the environmental community, and staffs of the State Water Board, Central Coast Regional Water Board, and the San Diego Regional Water Board.

(4) No later than October 1, 2011, the Review Committee, described above, shall provide a report for public comment detailing the scope of the special studies, including the degree to which existing, completed studies can be relied upon.

(5) No later than October 1, 2013 the Review Committee shall provide the final report and the Review Committee's comments for public comment detailing the results of the special studies and shall present the report to the State Water Board.

(6) Meetings of the Review Committee shall be open to the public and shall be noticed at least 10 days in advance of the meeting. All products of the Review Committee shall be made available to the public.

(7) The State Water Board shall consider the results of the special studies, and shall evaluate the need to modify this Policy with respect to the *nuclear-fueled power plants**. In evaluating the need to modify this Policy, the State Water Board shall base its decision to modify this Policy with respect to the *nuclear-fueled power plants** on the following factors:

(a) Costs of compliance in terms of total dollars and dollars per megawatt hour of electrical energy produced over an amortization period of 20 years;

(b) Ability to achieve compliance with Track 1 considering factors including, but not limited to, engineering constraints, space constraints, permitting constraints, and public safety considerations;

(c) Potential environmental impacts of compliance with Track 1, including, but not limited to, air emissions.

(8) If the State Water Board finds that for a specific *nuclear-fueled power plant** to implement Track 1, either (1) the costs are wholly out of proportion to the costs identified in Tetra Tech, Inc., California's Coastal Power Plants: Alternative Cooling System Analysis, February 2008 (see pages ES-10 [summary], C-1 - C-2 and C-23 - C-40 [Diablo Canyon Power Plant] and N-1 - N-2 and N-25 - N-42 [San Onofre Nuclear Generating Station]) and considered by the State Water Board in establishing Track 1, or (2) that compliance is wholly unreasonable based on the factors in paragraphs 7(b) and (c), then the State Water Board shall establish alternate requirements for that *nuclear-fueled power plant**. The State Water Board shall establish alternative requirements no less stringent than justified by the wholly out of proportion (i) cost and (ii) factor(s) of paragraph (7). The burden is on the person requesting the alternative requirement to demonstrate that alternative requirements should be authorized.

(9) In the event the State Water Board establishes alternate requirements for *nuclear-fueled power plants**, the difference in impacts to marine life resulting from any alternative, less stringent requirements shall be fully mitigated. Mitigation required pursuant to this paragraph shall be a *mitigation project** directed toward the increase in marine life associated with the State's Marine Protected Areas in the geographic region of the facility. Funding for the *mitigation project** shall be provided to the California Coastal Conservancy, working with the Ocean Protection Council to fund an appropriate *mitigation project**.

E. Table 1. Implementation Schedule

	Milestone	Responsible Entity/Party	Due Date[2]
1	Request SCE and PG&E to conduct special studies to investigate compliance options for *nuclear-fueled power plants** [Section 3.D]	State Water Board Executive Director	01/01/2011
2	Establish Review Committee [Section 3.D(3)]	State Water Board Executive Director	01/01/2011
3	Establish SACCWIS [Section 3.B]	State Water Board Executive Director	01/01/2011
4	Submit a proposed implementation plan to the State and Regional Water Boards [Section 3.A]	Owner/operators of existing fossil-fueled power plants	04/01/2011
5	Provide a report for public comment, detailing the scope of the special studies on compliance options for *nuclear-fueled power plants** [Section 3.D(4)]	Review Committee	10/01/2011
6	Review the owners or operators' proposed implementation schedules and report to the State Water Board with recommendations [Section 3.B(2)]	SACCWIS	10/01/2011
7	Humboldt Bay Power Plant in compliance	Owner/operator	12/31/2010
8	Potrero Power Plant in compliance	Owner/operator	10/01/2011
9	Install large organism exclusion devices with a distance between exclusion bars of no greater than nine inches, or equivalent device [Section 2.C(1)]	Owner/operators of *existing power plants** with *offshore intakes**	10/01/2011

[2] These compliance dates were developed considering information provided by the CEC, CPUC, CAISO, and LADWP.

	Milestone	Responsible Entity/Party	Due Date[2]
10	Cease intake flows for units not directly engaging in *power-generating activities** or *critical system maintenance**, or demonstrate to the State Water Board that a reduced minimum flow is necessary for operations [Section 2.C(2)]	Owner/operators of *existing power plants**	10/01/2011
11	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2012
12	South Bay Power Plant in compliance	Owner/operator	12/31/2011
13	Report to State Water Board on results of special studies on compliance options for *nuclear-fueled power plants** [Section 3.D(5)]	Review Committee	10/01/2013
14	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2013
15	Haynes units 5 & 6 in compliance, repowered without OTC	LADWP	12/31/2013
16	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2014
17	Commence to implement measures to mitigate the interim impingement and entrainment impacts due to the cooling water intake structure(s) [Section 2.C(3)]	Owners/operators of *existing power plants**	10/01/2015
18	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2015
19	El Segundo and Morro Bay power plants in compliance	Owner/operator	12/31/2015
20	Scattergood unit 3 in compliance, repowered without OTC	LADWP	12/31/2015
21	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2016
22	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2017

Milestone		Responsible Entity/Party	Due Date[2]
23	Power plants in CPUC 2010 LTPP Cycle in compliance: Encina, Contra Costa, Pittsburg, Moss Landing [Section 1.J]	Owner/Operator	12/31/2017
24	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2018
25	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2019
26	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2020
27	Power plants in CPUC 2012 LTPP Procurement Cycle in compliance: Huntington Beach, Redondo, Alamitos, Mandalay, Ormond Beach [Section 1.J] generating stations in compliance	Owner/operator	12/31/2020
28	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2021
29	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2022
30	San Onofre Nuclear Generating Station in compliance with implementation provisions resulting from State Water Board action on special studies from Section 3.D	Owner/operator	12/31/2022
31	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2023
32	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2024
33	Diablo Canyon Power Plant in compliance with implementation provisions resulting from State Water Board action on special studies from Section 3.D	Owner/operator	12/31/2024

Milestone		Responsible Entity/Party	Due Date[2]
34	Scattergood units 1 & 2 in compliance, repowered without OTC	LADWP	12/31/2024
35	Haynes units 1 & 2 in compliance, repowered without OTC	LADWP	12/31/2029[3]
36	Harbor unit 5 in compliance, repowered without OTC	LADWP	12/31/2029[3]
37	Haynes unit 8 in compliance, repowered without OTC	LADWP	12/31/2029[3]

4. Track 2 Monitoring Provisions

A. Impingement Impacts: The following impingement studies are required to comply with Section 2.A.(2)(a)(ii):

(1) A baseline impingement study shall be performed, unless the discharger demonstrates, to the Regional Water Board's satisfaction, that prior studies accurately reflect current impacts. Baseline impingement shall be measured on-site and shall include sampling for all species impinged. The impingement study shall be designed to accurately characterize the species currently impinged and their seasonal abundance to the satisfaction of the Regional Water Board.

(a) The study period shall be at least 36 consecutive months.

(b) Impingement shall be measured during different seasons when the cooling system is in operation and over 24-hour sampling periods.

(c) When applicable, impingement shall be sampled under differing representative operational conditions (e.g., differing levels of power production, heat treatments, etc.).

(d) The study shall not result in any additional mortality above typical operating conditions.

[3] The State Water Board will consider further modifications to the compliance date for these units when LADWP submits information responsive to the SACCWIS resolved clauses in its July 5, 2011 resolution and any subsequent information requests SACCWIS makes to LADWP by January 1, 2012. The State Water Board will consider amendments for these units no later than December 31, 2013.

(2) After the Track 2 controls are implemented, to confirm the level of impingement controls, another impingement study, consistent with Section 4.A(1)(a) to (d), above, shall be performed and reported to the Regional Water Board.

(3) The need for additional impingement studies shall be evaluated at the end of each permit period. Impingement studies shall be required when changing operational or environmental conditions indicate that new studies are needed, at the discretion of the Regional Water Board.

B. Entrainment Impacts: The following entrainment studies are required to comply with Section 2.A.(2)(b)(ii):

(1) A baseline entrainment study shall be performed, unless the discharger demonstrates, to the Regional Water Board's satisfaction, that prior studies accurately reflect current impacts. Prior studies that may have used a mesh size of 333 or 335 microns for sampling are acceptable for compliance with the review and approval of the Regional Water Board. If the Regional Water Board determines that a new baseline entrainment study shall be performed to determine larval composition and abundance in the source water, representative of water that is being entrained, then samples must be collected using a mesh size no larger than 335 microns. Additional samples shall also be collected using a 200 micron mesh to provide a broader characterization of other *meroplankton** entrained. The source water shall be determined based on oceanographic conditions reasonably expected after Track 2 controls are implemented. Baseline entrainment sampling shall provide an unbiased estimate of larvae entrained at the intake prior to the implementation of Track 2 controls.

(a) Entrainment impacts shall be based on sampling for all *ichthyoplankton** and invertebrate *meroplankton** species. Individuals collected shall be identified to the lowest taxonomical level practicable. When practicable, genetic identification through molecular biological techniques may be used to assist in compliance with this requirement. Samples shall be preserved and archived such that genetic identification is possible at a later date.

(b) The study period shall be at least 36 consecutive months, and shall occur during different seasons, including periods of peak use when the cooling system is in operation (such as the summer months when energy is in high demand). Sampling shall be designed to account for variation in oceanographic conditions and larval abundance and behavior such that abundance estimates are reasonably accurate.

(2) After the Track 2 controls are implemented, to confirm the level of entrainment controls, another entrainment study (with a study design to the Regional Water Board's satisfaction, with samples collected using a mesh size no larger than 335 microns, and with additional samples also collected using a 200 micron mesh) shall be performed and reported to the Regional Water Board.

(3) The need for additional entrainment studies shall be evaluated at the end of each permit period. Entrainment studies shall be required when changing operational or environmental conditions indicate that new studies are needed, at the discretion of the Regional Water Board.

5. Definition of Terms

Closed-cycle wet cooling system – Refers to a cooling system, which functions by transferring waste heat to the surrounding air through the evaporation of water, thus enabling the reuse of a smaller amount of water several times to achieve the desired cooling effect. The only discharge of wastewater is from periodic blowdown for the purpose of limiting the buildup of concentrations of materials in excess of desirable limits established by best engineering practice.

Combined-cycle power-generating units - Refers to units within a power plant which combined generate electricity through a two-stage process involving combustion and steam. Hot exhaust gas from combustion turbines is passed through a heat recovery steam generator to produce steam for a steam turbine. The turbine exhaust steam is condensed in the cooling system and may or may not be returned to the power cycle. Combined cycle power-generating units are generally more fuel-efficient and use less cooling water than steam boiler units with the same generating capacity.

Critical system maintenance – are activities that are critical for maintenance of a plant's physical machinery and absolutely cannot be postponed until the unit is operating to generate electricity.

Existing power plant(s) – Refers to any power plant that is not a *new power plant**.

Habitat production foregone – Refers to the product of the average annual *proportional mortality** and the estimated area of the water body that is habitat for the species' source population. Habitat production foregone is an estimate of habitat area production that is lost to all entrained species on an annual basis.

Ichthyoplankton – Refers to the planktonic early life stages of fish (i.e., the pelagic eggs and larval forms of fishes).

Intake flow rate – Refers to the instantaneous rate at which water is withdrawn through the intake structure, expressed as gallons per minute.

Meroplankton – For purposes of this Policy, refers to that component of the *zooplankton** community composed of squid paralarvae and the pelagic larvae of benthic invertebrates.

Mitigation project – Projects to restore marine life lost through impingement mortality and entrainment. Restoration of marine life may include projects to restore and/or enhance coastal marine or estuarine habitat, and may also include protection of marine life in existing marine habitat, for example through the funding of implementation and/or management of Marine Protected Areas.

New power plant – Refers to any plant that is a "new facility", as defined in 40 C.F.R. § 125.83 (revised as of July 1, 2007), and that is subject to Subpart I, Part 125 of the Code of Federal Regulations (revised as of July 1, 2007) (referred to as "Phase I regulations").

Not Feasible – Cannot be accomplished because of space constraints or the inability to obtain necessary permits due to public safety considerations, unacceptable environmental impacts, local ordinances, regulations, etc. Cost is not a factor to be considered when determining feasibility under Track 1.

Nuclear-fueled power plant(s) – Refers to Diablo Canyon Power Plant and/or San Onofre Nuclear Generating Station.

Offshore intake –refers to any submerged intake structure that is not located at the shoreline, and includes such intakes that are located in ocean, bay and estuary environments.

Power-generating activities – Refers to activities directly related the generation of electrical power, including start-up and shut-down procedures, contractual obligations (hot stand-by), hot bypasses, and *critical system maintenance** regulated by the Nuclear Regulatory Commission. Activities that are not considered directly related to the generation of electricity include (but are not limited to) dilution for in-plant wastes, maintenance of source-and receiving water quality strictly for monitoring purposes, and running pumps strictly to prevent fouling of condensers and other power plant equipment.

Proportional mortality – the proportion of larvae killed from entrainment to the larvae in the source population, as determined by an Empirical Transport Model.

Zooplankton – For purposes of this Policy, refers to those planktonic invertebrates larger than 200 microns.