

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

**TO EXTEND THE COMPLIANCE SCHEDULE
FOR THE REDONDO BEACH GENERATING STATION**

DRAFT STAFF REPORT

**State Water Resources Control Board
June 14, 2021**



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California Environmental Protection Agency
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Table of Contents

1. Executive Summary	5
2. Regulatory Background	7
2.1.Regulatory Background and Authority.....	7
2.2.Requirements When Amending the OTC Policy	9
3. Project Description	10
4. Environmental Setting	10
5. Rationale and Considerations for System-Wide Grid Reliability Compliance Date Extensions	10
5.1.Grid Reliability.....	10
5.2.Impacts to Marine Life.....	21
5.3.Mitigation of Impingement and Entrainment Impacts	24
5.4.Land Use Impacts	25
5.5.Air Quality Impacts	27
5.6.OTC Policy Amendment Preferred Approach.....	30
6. Analysis of Alternatives	31
7. Addendum to the 2010 Final SED	31
7.1.Water Quality and Biological Resources	35
7.2.Utilities and Service Systems	37
7.3.Air Quality.....	37
7.4.Aesthetics and Noise	38
8. Water Code Section 13140 and Other Required Considerations	39
8.1.Economic Analysis	39
8.2.The Human Right to Water.....	39
9. References.....	40

Abbreviations and Acronyms

Abbreviation or Acronym	Full Name or Phrase
AES	AES-Southland, Inc.
AQMD	Air Quality Management District
BAA	Balancing authority area
CAISO	California Independent System Operator
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CPUC	California Public Utilities Commission
CWA	Clean Water Act
HE	Hour ending
LSE	Load serving entity
MGD	Million gallons per day
MW	Megawatt
NOV	Notice of violation
NPDES	National Pollution Discharge Elimination System
OTC	Once-through cooling
OTC Policy	Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling
PRM	Planning reserve margin
RA	Resource adequacy
Redondo Beach	Redondo Beach Generating Station
Regional Water Board	Regional Water Quality Control Board
SACCWIS	Statewide Advisory Committee on Cooling Water Intake Structures
SED	Substitute environmental document
State Water Board	State Water Resources Control Board
TSO	Time schedule order
U.S. EPA	United States Environmental Protection Agency

1. Executive Summary

The State Water Resources Control Board (State Water Board) is considering an amendment to the statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (Once-Through Cooling or OTC Policy) to extend the compliance date for Redondo Beach Generating Station Units 5, 6, and 8 (Redondo Beach) for two years, from December 31, 2021, through December 31, 2023.

The OTC Policy establishes uniform, technology-based standards to implement federal Clean Water Act (CWA) section 316(b) and reduce the harmful effects associated with cooling water intake structures on marine and estuarine life. The State Water Board adopted the OTC Policy on May 4, 2010, under Resolution Number (No.) 2010-0020, and the Office of Administrative Law issued its approval on September 27, 2010. The OTC Policy became effective on October 1, 2010, and was amended in 2012, 2014, 2016, 2017, and 2020.

Originally, nineteen power plants located along the California coast withdrawing coastal and estuarine waters for cooling purposes using a single-pass system known as once-through cooling (OTC) were required to comply with the OTC Policy. Cooling water withdrawals cause adverse impacts when larger aquatic organisms, such as fish and mammals, are trapped against a facility's intake screens (impingement) and when smaller marine life, such as larvae and eggs, are killed by being drawn through the cooling system and exposed to high pressures and temperatures (entrainment).

The joint-agency Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) was created to advise the State Water Board on the implementation of the OTC Policy, ensuring the compliance schedule takes into account the reliability of California's electricity supply, including local area reliability, statewide grid reliability, and permitting constraints. The SACCWIS includes representatives from the California Energy Commission (CEC), California Public Utilities Commission (CPUC), California Coastal Commission (Coastal Commission), California State Lands Commission, California Air Resources Board (CARB), California Independent System Operator (CAISO), and the State Water Board.

The OTC Policy includes compliance dates for the nineteen power plants based on the planning and electricity procurement processes of the CEC, CAISO, and CPUC. These compliance dates were scheduled with orderly retirements and planned replacement of capacity aimed at maintaining local and system-wide electrical grid reliability in the State of California. The SACCWIS meets at least annually to review grid reliability studies from CAISO and Los Angeles Department of Water and Power and receive status updates on compliance from coastal power plants. Ten of the original nineteen power plants have permanently retired since adoption of the OTC Policy, and one power plant complied with Track 2 of the OTC Policy. The eight remaining power plants are

scheduled to comply by specific compliance dates within the next decade, as presented in Table 1 of the OTC Policy.

On September 1, 2020, the State Water Board amended the OTC Policy under Resolution No. 2020-0029, which extended the compliance dates of four OTC power plants that were originally scheduled to comply by December 31, 2020. Redondo Beach was extended by one year, and three other OTC power plants were extended by three years, as detailed in Section 2.1 below.

In August 2020, preceding the adoption of the 2020 OTC Policy Amendment, swaths of the western United States encountered a prolonged and extreme heat wave in August 2020. This led to a series of circumstances that ultimately required the CAISO to initiate rotating outages in its balancing authority area (BAA) to prevent wide-spread service interruptions. Since that time, critical analysis and uncertainties have sparked efforts from the CPUC, CAISO, and CEC to revise their forecasting models and have highlighted the need for additional capacity beyond summer 2021.

As a result of the heat wave and a subsequent directive from Governor Gavin Newsom to carry out a root cause analysis, the CPUC initiated Rulemaking (R.)20-11-003 to consider a suite of actions within its authority to address potential grid reliability issues starting in summer 2021. The CPUC adopted D.21-02-028 on February 11, 2021, which directed the three investor-owned utilities to seek contracts for energy capacity that will be available for the net peak demand in the summer of 2021. Building on R.20-11-003, the CPUC subsequently adopted D.21-03-056 on March 26, 2021, to direct investor-owned utilities to take actions to decrease peak and net peak demand and increase peak and net peak supply in the summers of 2021 and 2022.

While procurement efforts are still ongoing, a comprehensive stack analysis conducted by the CPUC, CAISO, and CEC indicates that additional procurement is needed to mitigate grid reliability concerns, including projected shortfalls in summer 2022. Further, the CPUC, CAISO, and CEC spotlighted critical uncertainties associated with energy supply and demand that warrant additional capacity in summer 2023.

On March 26, 2021, the SACCWIS adopted the Final 2021 Report of the SACCWIS (2021 SACCWIS Report), recommending the State Water Board consider extending the compliance date of Redondo Beach Units 5, 6, and 8 for two years through December 31, 2023. The power generated by Redondo Beach will help offset projected system-wide shortfalls during periods of high net peak demand.

This amendment to extend the compliance date for Redondo Beach to December 31, 2023, is similar to the 2020 OTC Policy amendment in that the capacity of Redondo Beach is needed as a temporary measure while both previously-enacted and ongoing actions are implemented to enhance grid reliability. The 2020 OTC Policy

amendment was supported by CPUC D.19-11-016, which addressed potential system reliability challenges. This amendment differs from the 2020 amendment primarily because actual system reliability events have demonstrated a need to re-evaluate the models and market practices that define California's grid and account for the hazards and uncertainties presented by climate change. Thus, while the underlying reason for the proposed extension of the compliance date for Redondo Beach is similar, this amendment is based on an updated analysis that reflects conditions that occurred during, and ultimately led to, the August 2020 blackouts.

The OTC Policy includes a provision that existing power plants must implement measures to mitigate the interim impingement and entrainment impacts resulting from cooling water intakes during operation until final compliance with the OTC Policy (Section 2.C(3)). Accordingly, the continued use of OTC waters by Redondo Beach will be subject to continued interim mitigation requirements as detailed in Resolution No. 2015-0057 until the power plant comes into final compliance. Further, total statewide OTC daily flow rates should not be significantly impacted by an extension of the Redondo Beach compliance date to December 31, 2023. Daily average OTC water use on a statewide scale is projected to be at or below design flow rates from the original OTC Policy compliance schedule when the policy was adopted in 2010.

Additionally, extending the compliance date of Redondo Beach will extend existing air, noise, and aesthetic impacts; however, impacts are expected to remain less than the baseline condition established in the 2010 Final SED.

2. Regulatory Background

2.1. Regulatory Background and Authority

In 1972, Congress enacted the CWA to restore and maintain the chemical, physical, and biological integrity of the nation's waters. CWA section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts.

In 2001, the U.S. Environmental Protection Agency (U.S. EPA) adopted regulations for new power plants (Phase I) that established a performance standard for cooling water intakes based on closed-cycle wet cooling. In 2004, U.S. EPA published the Phase II rule applicable to existing power plants with a design intake flow greater than or equal to 50 million gallons per day (MGD), which was remanded following legal challenge. In May 2014, U.S. EPA finalized regulations covering existing facilities that withdraw at least 2 MGD of cooling water. Facilities select from options designed to reduce impingement to meet best technology available requirements. Facilities that withdraw at least 125 MGD are required to conduct studies to investigate site-specific controls to reduce entrainment impacts. New units added to existing facilities are subject to similar

requirements established for new facilities. The new regulation was published in the Federal Register on August 15, 2014, and became effective on October 14, 2014 (U.S. EPA, 2014).

The State Water Board is designated as the state water pollution control agency for all purposes under the CWA. The State of California's Porter-Cologne Water Quality Control Act of 1969 authorizes the State Water Board to adopt statewide water quality control plans and policies. The OTC Policy, adopted by the State Water Board on May 4, 2010, under Resolution No. 2010- 0020, established requirements for the implementation of CWA section 316(b) for existing coastal power plants in California, using best professional judgment in determining best technology available for cooling water intake structures. The best technology available was determined to be closed-cycle wet cooling, or equivalent. The OTC Policy is implemented through National Pollutant Discharge Elimination System (NPDES) permits, issued pursuant to CWA section 402, which authorize the point source discharge of pollutants to navigable waters. The OTC Policy initially assigned the State Water Board as the entity responsible for issuing or modifying NPDES permits for power plants subject to the Policy. A subsequent OTC Policy amendment adopted pursuant to State Water Board Resolution No. 2013-0018 returned responsibility for these NPDES permits to the power plant's corresponding Regional Water Quality Control Board (Regional Water Board).

On November 7, 2019, the CPUC adopted Decision (D.)19-11-016, which directed load serving entities (LSEs) within its jurisdiction to procure 3,300 Megawatts (MW) of new capacity by August 1, 2023, and also recommended extensions of OTC Policy compliance dates for four OTC generators while procurement is underway.

On January 23, 2020, the SACCWIS recommended a modified extension schedule for the same four generators. On September 1, 2020, the State Water Board amended the OTC Policy under Resolution No. 2020-0029, which extended the compliance dates of the four power plants to address system-wide grid reliability in the CAISO BAA. This 2020 OTC Policy Amendment was approved by the Office of Administrative Law on November 30, 2020. The 2020 OTC Policy Amendment extended the compliance dates of four OTC power plants as follows:

- Alamitos Generating Station Units 3, 4, and 5 for three years, from December 31, 2020, through December 31, 2023;
- Huntington Beach Generating Station Unit 2 for three years, from December 31, 2020, through December 31, 2023;
- Ormond Beach Generating Station Units 1 and 2 for three years, from December 31, 2020, through December 31, 2023; and,
- Redondo Beach Generating Station Units 5, 6, and 8 for one year, from

December 31, 2020, through December 31, 2021.

All facilities subject to the OTC Policy are required to comply with applicable regulatory requirements that are designed to minimize environmental impacts and protect human health, including all state and local permits. If the compliance date of Redondo Beach is extended, Redondo Beach would continue to be regulated by applicable air and water quality permits, therefore continuing to comply with requirements imposed in order to minimize environmental impacts and be protective of human health.

Because the OTC Policy requirements are equivalent to, if not more stringent than those contained in applicable U.S. EPA regulations, OTC Policy requirements continue to govern the existing coastal power plants in California. The U.S. EPA rule explicitly states that it is within the states' authority to implement requirements that are more stringent than the federal requirements.

2.2. Requirements When Amending the OTC Policy

The State Water Board must comply with all applicable state and federal public participation requirements and state laws governing environmental and peer review when amending a state policy for water quality control. However, the proposed OTC Policy amendment does not require peer review or a new CEQA analysis, as set forth more fully below and in Section 7.

To the extent that any approval constitutes a project within the meaning of the California Environmental Quality Act (CEQA), the State Water Board is the lead agency and is responsible for preparing any required environmental documentation for the amendment. The California Secretary of Resources has certified the State Water Board's water quality planning process as exempt from certain CEQA requirements when adopting plans, policies, and guidelines, including preparation of an initial study, negative declaration, and environmental impact report.

CEQA imposes specific obligations on the State Water Board when it establishes performance standards. Public Resources Code Section 21159 requires that an environmental analysis of the reasonably foreseeable methods of compliance be conducted. The environmental analysis must address the reasonably foreseeable environmental impacts of the methods of compliance, reasonably foreseeable alternatives, and mitigation measures. This amendment does not constitute a project within the meaning of CEQA because it continues the status quo and does not result in any direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment beyond what was considered in the 2010 Final SED. State Water Board regulations governing CEQA do not apply when the State Water Board determines that the activity is not subject to CEQA. Title 23, California Code of Regulations, § 3720, subd. (b). While the amendment does not constitute a

project within the meaning of CEQA, an addendum to the May 4, 2010 Final Substitute Environmental Documentation (SED, hereafter referred to as the 2010 Final SED) is included in Section 7 of this Staff Report in order to provide additional information about the amendment.

Health and Safety Code Section 57004 requires external scientific peer review of the scientific basis for any rule proposed by any board, office, or department within the California Environmental Protection Agency. However, because this amendment does not establish a new regulatory level, standard, or other requirement based on scientific findings, conclusions, or assumptions, peer review requirements do not apply.

3. Project Description

The State Water Board is considering an amendment to the OTC Policy to extend the compliance date of Redondo Beach Generating Station Units 5, 6, and 8 for two years, from December 31, 2021, through December 31, 2023, in order to address system-wide grid reliability concerns through 2023. This amendment is based upon the SACCWIS' analysis of alternatives and recommendations included in its final report adopted on March 26, 2021, and upon the rationale and considerations described in this Staff Report. This amendment would be reflected in Section 3.E, Table 1 of the OTC Policy.

4. Environmental Setting

Section 2.1 of the 2010 Final SED describes the environmental settings of regions with existing OTC power plants. Redondo Beach is located in Los Angeles County, and falls within the jurisdiction of the Los Angeles Regional Water Board (State Water Board, 2010). Sections 2.2 through 2.6 of the 2010 Final SED describe baseline environmental conditions associated with operation of coastal power plants using OTC.

5. Rationale and Considerations for Redondo Beach Compliance Date Extension

5.1. Grid Reliability

Events and Conditions Leading to the Amendment

System-wide grid reliability requires that power supply and demand must be equal at any given moment so as to avoid placing unnecessary stress on the electrical transmission system.

From August 14 through 19, 2020, large portions of the western United States encountered extreme and prolonged heat conditions. In swaths of California, temperatures were, on average, 10-20 degrees higher than normal, affecting some 32 million residents of the state. This climate change-induced event impacted both

demand for and supply of generation. Under typical conditions, higher demand day-time periods are offset by cooler evening conditions. However, demand remained high for much of this heat wave due to elevated evening temperatures. Supply was unable to keep pace with elevated demand. Generation resources were constrained by the availability of light for solar resources, thermal impacts on equipment, and availability of water for hydroelectric generation. Normally, CAISO is able to mitigate reduced generation at least partially by importing electricity. However, because the heat wave impacted a large area of the West Coast of the United States, imports of electricity from other balancing authorities in the Western Interconnection grid were significantly reduced.

As a result of these extreme conditions, CAISO declared Stage 3 Emergencies on August 14 and 15, 2020. A Stage 3 Emergency occurs when load interruption is imminent or in progress, and CAISO is unable to meet minimum contingency reserve requirements promulgated by the North American Electric Reliability Corporation and the Western Electricity Coordinating Council regional variations as approved by the Federal Energy Regulatory Commission. To avoid uncontrolled load shedding that could destabilize other segments of the Western Interconnection grid, the CAISO coordinated efforts with utilities to conduct firm load shedding, leading to rotating but controlled blackouts for portions of California.

Stack Analysis and Actions Taken to Improve Grid Reliability

Following these events, the state's energy agencies initiated a series of actions to investigate the causes of the August 2020 blackouts and to reduce the likelihood of future blackouts under similar circumstances. On November 20, 2020, the CPUC initiated R.20-11-003 to identify and execute all actions within its authority to ensure reliable electric service in the event of similar extreme heat waves. Additionally, Governor Gavin Newsom ordered the state's energy agencies to investigate and report on the root causes of the events leading to the August 2020 blackouts. These findings were included in the Final Root Cause Analysis Report published on January 13, 2021, and were primarily related to climate change-induced extreme weather conditions, availability of energy supply, and adequacy of market practices to meet associated energy demands.

Building on these efforts, the state's energy agencies conducted a comprehensive system-wide analysis, or stack analysis, to compare forecasted demand to the capacity of all existing resources and resources expected to be online in 2022. This stack analysis was conducted using two planning reserve margin (PRM) scenarios. The PRM is comprised of a margin for required operating reserves, an allowance for above average demand, and a system-wide generator forced outage rate to meet demand during peak demand periods. The first scenario used a 15 percent PRM, which has

been California's standard since 2004. The second scenario used a 17.5 percent PRM, which was recently adopted by the CPUC as an interim approach that effectively increases the PRM beginning summer 2021 to address the findings of the Final Root Cause Analysis Report. The 17.5 percent PRM is discussed in greater detail below.

The stack analysis demonstrated that energy supply is insufficient to meet projected demand in 2022. Specifically, the stack analysis projected a shortfall would occur during September 2022 with a 15 percent PRM and July and September 2022 with a 17.5 percent PRM. The shortfall reinforces the need for all available capacity to reduce the risks of blackouts and brownouts, and is discussed in greater detail below.

The stack analysis' projected deficit is conservative, as it assumes LSEs will contract with all existing and incremental resources known today. The stack analysis also assumes that all existing resources today (except for Redondo Beach) remain operational through summer 2022, incremental resources come online as expected, and LSEs are able to contract for all resources within the CAISO BAA, plus at least the five-year historical average level of resource adequacy (RA) imports. Additional assumptions and details pertaining to this exercise can be found in the Final 2021 Report of the SACCWIS.

In addition to decisions associated with R.20-11-003 and further reinforcing the need for all available capacity, energy agencies have taken actions to ensure all viable resources are available to bolster grid reliability in coming years. For instance, the CPUC adopted D.19-11-016 on November 13, 2019, which ordered procurement of 3,300 MW of incremental resources with 50 percent required to be online by August 2021. Fossil-fueled resources, such as the OTC plants, are not considered a part of this 3,300 MW of procurement.

The CAISO recently acted to retain all viable resources in the near future. In 2020, the CAISO Board of Governors authorized the first-ever, system-level Reliability-Must-Run designation for approximately 400 MW of resources which had previously notified the CAISO of their intent to retire or mothball. A Reliability-Must-Run designation is used to contract with a resource that is in its retirement process for the purpose of maintaining local, system, and flexible capacity reliability needs. In April 2021, the CAISO Board of Governors authorized another system-level Reliability-Must-Run for 38 MW of capacity from a cogeneration power plant. Designating system-level Reliability-Must-Run indicates that all resources within the CAISO system are needed to maintain grid reliability, including Redondo Beach. It should be noted that these resources were included in the stack analysis conducted in early 2021, so projected shortfalls are based on analysis that included all existing and functional resources.

As well as shorter-term Reliability-Must-Run actions, the energy agencies have undertaken actions to study grid reliability and its associations with climate change. For

example, the CEC's Energy Research and Development Division, which develops long-term planning projections and targets, is engaged in efforts to improve future demand forecasts to account for climate change. This work is expected to begin by the end of 2021.

Finally, the CAISO has opened stakeholder processes to evaluate prioritization of electricity imports and exports. Electricity import and export markets play a vital role in the operation and maintenance of the nation's grids. During the August 2020 blackouts, the CAISO was scheduled to export electricity; however, the CAISO was import-dependent during all hours of the outage events, and in fact was a net importer of energy across all hours of both the day-ahead and real-time markets from August 13 through 15. Energy Imbalance Market transfers added another 1,500 MW of imports on August 14 and 600 MW of imports on August 15 when the CAISO declared Stage 3 emergencies on these dates.

The CAISO balances its responsibility to meet internal energy demands with its responsibility to collaborate with the rest of the Western Interconnection grid in maintaining an open and fair market. Exports ultimately play an important role in the operation of this regional system, upon which the CAISO depends for imports. However, in response to the August 2020 blackouts, the CAISO conducted a stakeholder initiative to ensure treatment of exports and native load are given the appropriate prioritization to maintain reliability. This initiative is supported by D.21-03-056, which noted that all eligible RA system resources supporting the effective 17.5 percent PRM are "visible to the CAISO as RA resources not eligible for export."

Planning Reserve Margin and Projected Shortfall in 2022

While the energy agencies were conducting a stack analysis in early 2021, the CPUC adopted D.21-02-028 on February 11, 2021. This Decision stemmed from R.20-11-003 and directed the three investor-owned utilities to seek contracts for expedited incremental capacity procurement available during the peak and net peak demand period in summer 2021. It also anticipated a subsequent decision to address other reliability actions, such as demand-side measures, and 2022 capacity needs as necessary. Consequentially, the CPUC adopted D.21-03-056 on March 26, 2021, which laid out actions to both decrease energy demand and increase energy supply during peak demand and net demand peak hours in the summers of 2021 and 2022 for grid reliability. Specifically, this decision addressed: Flex Alert program authorization and design; modifications to and expansion of the Critical Peak Pricing Program; the development of an Emergency Load Reduction Program; modifications to existing demand response programs; modifications to the PRM as discussed in detail below; parameters for supply side capacity procurement; and expanded electric vehicle participation.

While D.21-03-056 did not order incentives to expedite procurement ordered under D.19-11-016 due to market considerations, it did reserve the right for CPUC to consider incentives for expedited procurement due to come online in August 2022 or August 2023.

Through D.21-03-056, the CPUC modified the PRM on a temporary basis in the summers of 2021 and 2022. This Decision underpinned the need for retention of all available capacity during summer months in 2022, such as Redondo Beach. In previous testimony, the CAISO had recommended an increase of the PRM from 15 to 17.5 percent, to “account for increased levels of forced outages currently being experienced by California’s fleet.” The CAISO also suggested applying this modified PRM when solar generation is at or near zero, which typically coincides with the net peak demand period in summer months.

In considering the PRM modification, the CPUC noted a suite of challenges that would inhibit a permanent change and would likely require a separate proceeding, including: changing system RA requirements mid-year and developing an associated penalty and waiver process; revising RA program rules to reflect solar generation; coordination with individual LSEs to meet this new requirement in addition to procurement directed for investor-owned utilities to perform on behalf of all LSEs in associated service territories; and emergency program triggers and associations with RA requirements. The CPUC also found that broad changes to RA requirements and resource planning metrics should be made in associated RA and resource planning proceedings. Simultaneously, the CPUC acknowledged the need for expeditious procurement of additional resources in light of the August 2020 blackouts and the potential for similar and more frequent events in the future.

Therefore, the CPUC adopted an interim PRM increase of 2.5 percent of the forecasted peak demand of CPUC’s jurisdictional LSEs and directed the three investor-owned utilities to procure associated additional resources in 2021 and 2022. It should be noted that the PRM increase is targeted and temporary to maximize grid reliability in the short-term while minimizing the risks of market changes that could detrimentally impact ratepayers. Further, the PRM increase is not directly connected with the RA program, since some procurement under the 2021 Emergency Reliability proceeding will not be eligible to participate in the RA program. Thus, the interim PRM should not be confused with potential or ongoing actions to bolster grid reliability in the long-term, such as a permanent PRM change that would apply to the RA program.

The interim PRM change was reflected in the energy agency’s stack analysis conducted in early 2021. Based on only the existing and expected online incremental resources, there is a 2,563 MW projected shortfall in September under the 17.5 percent interim PRM, and a 414 MW shortfall in July, as shown in Table 1 below. Taking into account

CPUC expedited procurement associated with D.19-11-016 and R.20-11-003, this shortfall is reduced to 1,063 MW in September 2022 under the 17.5 percent interim PRM, and the projected shortfall in July is negated, as shown in Table 2 below. It should be noted that the stack analysis projected a 70 MW surplus under the 15 percent PRM; however, the Final SACCWIS Report was adopted while CPUC proceedings associated with R.20-11-003 were still ongoing, and the adoption of D.21-03-056 negated this projected surplus by adopting the 17.5 percent interim PRM.

Table 1 provides the numerical comparison between the total resource stack versus the load for Hour Ending (HE) 8 p.m. Pacific Daylight Time (PDT), plus a 15 percent and 17.5 percent PRM.

Table 1: Surplus and Shortfall of 2022 Existing and Expected Online Resource Stack Without Redondo Beach as Compared to Load for HE 8 p.m. PDT Plus 15 percent and 17.5 percent PRM (MW)

Month	Existing and expected online resource stack without Redondo Beach	Load for HE 8 p.m. PDT	15% PRM plus load for HE 8 p.m. PDT	17.5% PRM plus load for HE 8 p.m. PDT	Resource stack minus 15% PRM plus load ([B] - [D])	Resource stack minus 17.5% PRM plus load ([B] - [E])
[A]	[B]	[C]	[D]	[E]	[F]	[G]
June	49,466	41,204	47,385	48,415	2,082	1,051
July	50,819	43,603	50,143	51,233	676	(414)
August	52,073	44,009	50,610	51,711	1,463	363
September	50,715	45,343	52,145	53,278	(1,430)	(2,563)
October	47,537	37,036	42,591	43,517	4,946	4,020

Note: In columns [F] and [G], a surplus is shown in black font and a shortfall is shown in red font within parentheses.

Table 2 below compares stack analysis projections for September 2022, the month with the largest anticipated shortfall, to CPUC staff estimates for expedited procurement that is effective at the 8 p.m. hour. Assuming the expedited procurement results in 1,500 MW of additional capacity that can effectively address energy needs during the net demand peak, there is still a 1,063 MW shortfall under the 17.5 percent interim PRM.

Table 2: Surplus and Shortfall for September 2022 Total Resource Stack as Compared to Load for HE 8 p.m. PDT Plus 15 percent and 17.5 percent PRM (MW)

	15% PRM	17.5% PRM
[1] Existing and expected online resource stack	(1,430)	(2,563)
[2] Estimated CPUC expedited procurement	1,500	1,500
[3] Sub-total with only expedited procurement	70	(1,063)
[4] Redondo Beach Units 5, 6, and 8 (RB)	834	834
[5] Total with expedited procurement and RB	904	(229)

Note: A surplus is shown in black font and a shortfall is shown in red font within parentheses.

Grid and Energy Uncertainties in 2023

In developing the stack analysis, the energy agencies pointed to several uncertainties that inhibit the development of a conclusive stack analysis through 2023. These uncertainties include:

1. Whether authorized or proposed procurement will adequately address the net demand peak period;
2. Whether imports can be successfully contracted for up to at least the historical average RA levels despite tightening supply conditions in the rest of the West;
3. Whether resources assumed online today will remain so beyond 2021 and perform as expected;
4. Planning processes have not entirely changed to address high loads and the net demand peak but expedited actions seek to provide a stop-gap;
5. Processes that address additional procurement and market changes are still in progress, and once implemented, a fair amount of uncertainty regarding their effectiveness will remain, and;
6. Lastly, there are a variety of climate change-induced and real-time conditions that could negatively impact the operation of the fleet but are unknown until much closer to the operational period, such as drought, wildfire, and cloud cover, all of which may threaten the integrity or efficacy of generation or transmission assets.

Developing a definitive energy analysis, such as a stack analysis, for longer-term scenarios is a complex and challenging task. As noted in the Final 2021 SACCWIS Report, neither the 2022 nor 2023 net qualifying capacity lists are available. Current

procurement authorizations are either currently in progress or not yet approved, and the RA program continues to evolve. Furthermore, LSEs are not required to report the entirety of their RA procurement until 45 days prior to the operating month. For example, the total procurement for September 2022 will not be fully known until mid-July 2022. Given these reasons, a stack analysis cannot be conducted for 2023 at this time.

While a conclusive stack analysis cannot be conducted for 2023 at this time, the CEC develops long-term energy projections that take into account a host of factors. As noted in the Final 2021 SACCWIS Report, the CEC produced a demand forecast for 2023 that shows approximately 500 MW of load increase at HE 8:00 pm Pacific Daylight Time between 2022 and 2023.

Taken together, these variables support Redondo Beach's extension through 2023. Additionally, extending the compliance date of Redondo Beach through 2023 would guarantee that its capacity remains available for contracting with LSEs in 2023. Further, an extension only through the end of 2022 may not allow State Water Board staff adequate time to prepare another OTC Policy amendment should a determination of another projected shortfall be made for 2023.

Alternatives and Findings from the March 26, 2021 SACCWIS Report

On March 26, 2021, the SACCWIS convened and approved the 2021 SACCWIS Report, which presents alternatives and a recommendation to the State Water Board to consider extending the OTC compliance date of Redondo Beach by two years to address the aforementioned system-wide grid reliability issues. The alternatives from the approved Final 2021 Report of the SACCWIS are listed below.

1. Alternative 1 (Recommended): Extend the compliance date for Redondo Beach Units 5, 6, and 8 for two years, through December 31, 2023.

This alternative would ensure the availability of capacity from Redondo Beach for contracting during peak months and would help meet system reliability needs in summer 2022, as identified by the stack analysis. The second year of extension is necessary to address the uncertainty in the 2023 resource supply stack and the CEC's forecasted 500 MW increase in demand between 2022 and 2023.

Even with an extension of Redondo Beach's compliance date, California may still experience blackouts or brownouts during times when electrical demand is high and imports are unreliable due to similar high demands in other states or BAAs, such as during extreme and prolonged heat waves. However, this risk would be reduced with the availability of capacity provided by Redondo Beach.

2. Alternative 2: Extend the compliance date for Redondo Beach Units 5, 6, and 8 for one year, through December 31, 2022.

This alternative would ensure the availability of capacity from Redondo Beach for contracting during peak months and would help meet system reliability needs in summer 2022, as identified by the stack analysis. Similar to Alternative 1, California may still experience blackouts or brownouts during times when electrical demand is high and imports are unreliable due to similar high demands in other states or BAAs, such as during extreme and prolonged heat waves. However, this risk would be reduced in 2022 with the availability of capacity provided by Redondo Beach.

While this alternative would partially offset shortfalls in 2022, it would not help meet system reliability needs in 2023. If a need is subsequently identified for additional capacity in 2023, there may not be enough time to conduct regulatory processes to amend the OTC Policy and further extend the compliance date. Similarly, depending on when a need is identified, the resource owner may not be capable of keeping the plant in service for an additional year.

3. Alternative 3: No action. Redondo Beach would stop using ocean water for OTC on or before December 31, 2021. California would be at higher risk of experiencing blackouts or brownouts during times when electrical demand is high and imports are unreliable due to similar high demand in other states or BAAs.

At the March 26, 2021 meeting, the SACCWIS approved Alternative 1 as its preferred recommendation to the State Water Board. Section 3.B.(5) of the OTC Policy states that the State Water Board shall consider the SACCWIS' recommendations and, if appropriate, consider modifications to the OTC Policy. In the event that the SACCWIS energy agencies make a unanimous recommendation for implementation schedule modification based on grid reliability, the State Water Board shall afford significant weight to the recommendation.

Redondo Beach's Role in Grid Reliability

To effectively maintain balance in power supply and demand within a BAA, the responsible balancing authority continuously forecasts, monitors, and adjusts electrical supply to meet demand. Balancing supply and demand can be achieved through several processes, one of which is the dispatch of generation assets by the responsible balancing authority.

As power demand is variable and production is tied to an array of factors, some types of electrical generation assets are dispatched to serve load more frequently than others, while other generation assets are generally reserved for peak demand, or contingency, periods. The power plants reserved for peak demand periods are colloquially referred to as "peaker plants" or "peakers." To demonstrate an example of the role peakers play in maintaining grid reliability, energy usage typically spikes during heat waves, when air-

conditioning usage is widespread. These periods often require the dispatching of peakers to serve load.

In the context of grid reliability, this means that spinning generators, such as OTC facilities, may require dispatch during peak demand periods. Peakers also play a role in maintaining grid reliability during emergency scenarios, such as natural disasters that damage, destroy, or otherwise require the shutdown of electrical generation or transmission infrastructure.

While Redondo Beach was originally constructed and used as a baseload resource, it now primarily functions like a peaker plant by remaining in a near-ready state, or “hot standby” status, that allows units to be brought online in short order. Between 2016 and 2019 (most recent year that annual capacity factors are available), Redondo Beach operated on total cumulative average at 2.7 percent of capacity. Redondo Beach is expected to continue operating like a peaker plant until its compliance date.

Further, it should be noted that capacity factors do not reflect the importance of a resource in maintaining grid reliability. While Redondo Beach has operated at a relatively low capacity factor in recent years, fossil-fueled OTC generators like Redondo Beach are typically dispatched when demand is high and the CAISO has limited other options to maintain grid reliability.

Additionally, the dispatch order of generation resources is generally driven by marginal costs of operation, where resources with lower marginal costs are typically dispatched before those with higher costs. The older age of many OTC units means they have higher marginal costs of operation. Since resources are generally dispatched when demand drives energy prices above those resources’ costs, newer and more efficient existing resources are generally used before resorting to dispatching OTC power plants like Redondo Beach.

Although Redondo Beach may be dispatched last, its capacity is still needed to bolster grid reliability in 2022 and to compensate for the band of uncertainty that has been identified in 2023. Without its capacity, California would be more susceptible to potential blackouts or brownouts.

If future Integrated Resource Plan processes by the CPUC show that Redondo Beach is no longer necessary to ensure system-wide grid reliability through December 31, 2023, Redondo Beach’s owner and operator could elect to retire the units early.

The Changing Nature of California’s Grid

Balancing authorities employ a number of generation resources to ensure grid reliability. In California, renewable energy resources, such as wind and solar, are progressively playing a larger role in electrical generation, as required by the 100 Percent Clean

Energy Act of 2018 (SB 100) and the Clean Energy and Pollution Reduction Act (SB 350). Incorporating renewable energy resources into the grid plays an important role in reducing greenhouse gas emissions and mitigating the impacts of climate change.

While wind and solar resources are increasingly playing a greater role in electricity production in California, they are inherently variable, as production is directly tied to wind and solar availability and activity. This variability is reflected in the Effective Load Carrying Capability (ELCC) and net qualifying capacity values of these resources. ELCC expresses the extent to which a resource is able to meet reliability conditions and reduce expected reliability problems or outage events (considering availability and use limitations), while net qualifying capacity is the number of Megawatts eligible to be counted towards meeting a LSE's system and local RA requirements, subject to deliverability constraints. Hence, renewable energy resources generally have a lower net qualifying capacity value compared to non-renewable forms of energy production.

The build-out of renewable resources poses a conundrum in which more energy is needed at precisely the time when solar is declining. In 2018, solar generation provided approximately 14 percent of California's total in-state generation. At night, some demand for electricity is served by wind generation. The remainder of the demand not served by solar and wind generation is known as the net demand, and it is served by other resources within the CAISO system, including fossil-fueled OTC power plants such as Redondo Beach. Further, on hot summer days, load may remain high well after sunset because of air conditioning demand. As the Final Root Cause Analysis demonstrated, resource planning targets have not kept pace to ensure sufficient resources are available that can be relied upon to meet demand in the early evening hours after sunset.

One potential solution to mitigate this issue is to develop facilities that can store energy during periods of elevated renewable generation, such as battery storage. Battery storage is increasingly playing a greater role in the operation of California's grid, yet currently constitutes a comparatively small portion of California's supply stack, and procurement and construction of new energy storage facilities takes time. Battery storage also poses operational uncertainties that require careful planning to mitigate.

Relation to 2020 Amendment

This amendment to extend the compliance date for Redondo Beach to December 31, 2023 is similar to the 2020 OTC Policy amendment in that the capacity of Redondo Beach is needed as a temporary measure while both previously-enacted and ongoing actions are implemented to enhance grid reliability. The 2020 OTC Policy amendment was supported by CPUC D.19-11-016, which addressed potential system reliability challenges. This amendment differs primarily by actual system reliability events that demonstrated a need to re-evaluate the models, and market practices that define

California's grid and account for the hazards and uncertainties presented by climate change. Thus, while the underlying reason for the proposed extension of the compliance date for Redondo Beach is similar, this amendment is based on an updated analysis that reflects previously unforeseen conditions that occurred during, and ultimately led to, the August 2020 blackouts.

Additionally, the State Water Board recognized in its adoption of the 2020 OTC Policy Amendment that the August 2020 blackouts were caused by a heat wave that could change energy projections and precipitate future OTC Policy amendments to support grid reliability. State Water Board Resolution No. 2020-0029 states the following at Finding 20: "Portions of California were subject to rotating power outages during mid-August 2020 due to unexpectedly high peak energy demands during widespread extreme high temperatures. The CPUC, CAISO, and CEC may be revising their forecasting models to account for this scenario, and may determine that there is a need to request additional extensions of final compliance dates to maintain grid reliability and avoid similar blackouts in the future."

COVID-19 Pandemic Impacts on Procurement

At the time of the adoption of the 2020 OTC Policy amendment, there were some concerns regarding the effects of the COVID-19 pandemic on grid reliability. The impacts of COVID-19 on reliability were analyzed by the CAISO through a backcast analysis as mentioned in the Final Root Cause Analysis. The backcast analysis removed large weather errors in order to isolate any potential impacts from the COVID-19 stay-at-home order within the March 17, 2020, to July 26, 2020 timeframe. Based on this analysis, CAISO did not observe significant load reductions when compared to pre-COVID-19 conditions and determined that the COVID-19 stay-at-home order did not impact grid reliability.

Also at the time of adoption of the 2020 OTC Policy amendment, some individuals expressed concern regarding the impacts of COVID-19 on procurement associated with D.19-11-016. However, the first quarterly report submitted by the CPUC to provide updates on this procurement, as requested by Resolution No. 2020-0029, indicated that procurement is generally meeting targets. While CPUC staff indicated that 91 MW of the 1,750 MW required to be online by August 1, 2021 is delayed, no LSE has indicated that it does not anticipate meeting requirements. The small portion of the procurement ordered online that is delayed did not impact the 2021 stack analysis conducted by the energy agencies.

5.2. Impacts to Marine Life

Sections 2.2 and 2.3 of the 2010 Final SED established baseline impacts to marine life through analysis of impingement and entrainment studies conducted from 2000-2005 at

eighteen of the nineteen coastal OTC power plants. The consensus among regulatory agencies at both the state and federal levels is that OTC systems contribute to the degradation of aquatic life in their respective ecosystems. Installation of reasonably foreseeable methods of compliance were found to reduce either impingement or entrainment impacts by 90 percent to 97 percent, depending on the technology selected.

The 2010 Final SED showed that OTC units among the nineteen power plants operated at varying efficiencies (volume of cooling water in millions of gallons required per megawatt-hour generated), depending on the type of boiler system and general age of the unit. For example, combined-cycle units were found to be up to 50 percent more efficient than steam boilers. Redondo Beach Units 5, 6, and 8 are all steam boilers and are the oldest among the remaining OTC units, having been constructed in 1954 and 1957.

Since adoption of the OTC Policy, Redondo Beach has operated at decreasing capacities, with average annual capacity factors decreasing from 4.7 percent in 2012 to 1.6 percent in 2019. If its compliance date is extended, Redondo Beach is expected to operate at or below the annual average capacity factors from 2019, thereby minimizing impingement and entrainment impacts.

As shown in Figures 1 and 2, which display the historic and projected water usage by the combined OTC fleet without and with a Redondo Beach extension, total statewide OTC daily flow rates should not be significantly impacted by an extension of the Redondo Beach compliance date to December 31, 2023. Additionally, daily average OTC water use on a statewide scale is projected to be at or below design flow rates from the original OTC Policy compliance schedule when the policy was adopted in 2010.

Based on these findings, impacts to marine life are expected to be at or below the baseline established in the 2010 Final SED if the compliance date for Redondo Beach is extended. See Section 7 of this Staff Report for additional discussion.

Figure 1: Historic and Projected Water Usage by the Combined OTC Fleet Without a Redondo Beach Extension

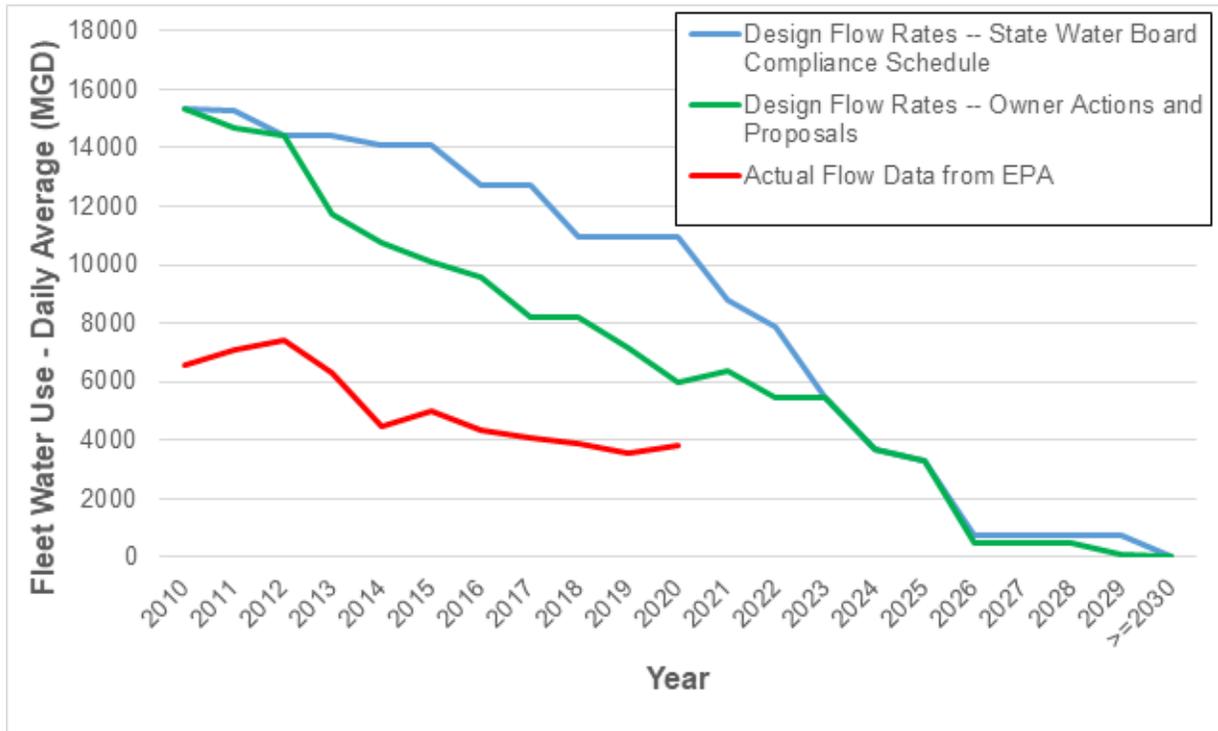
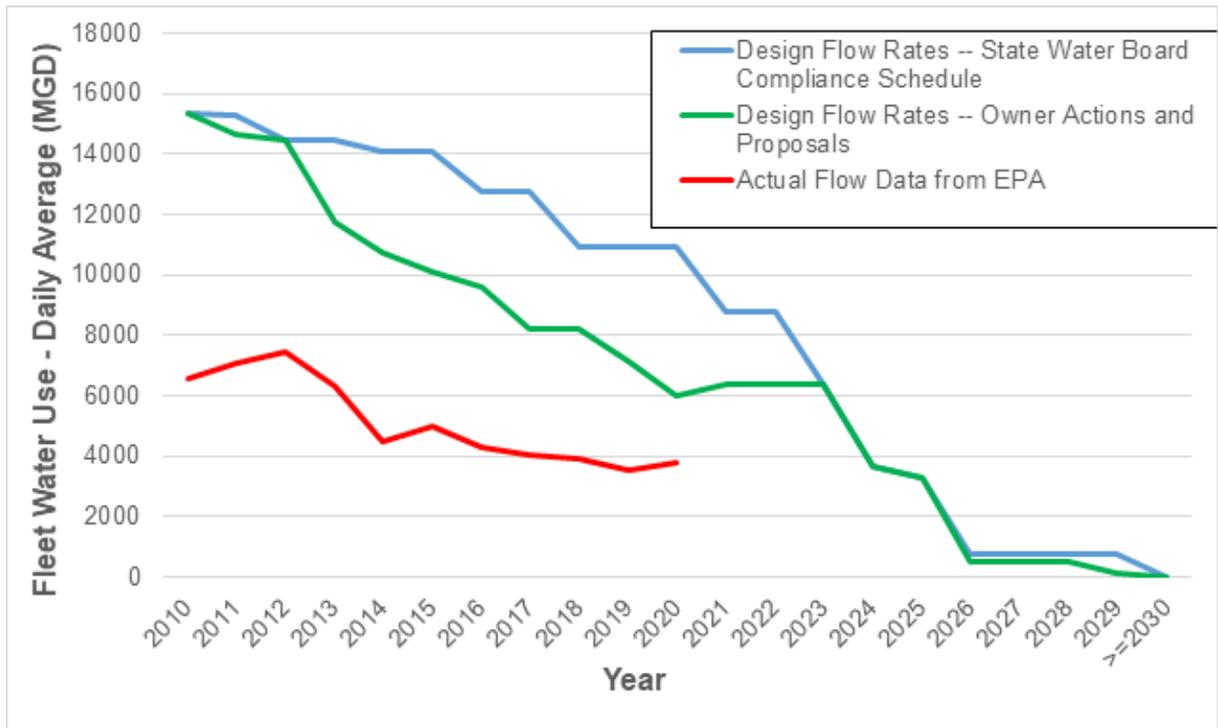


Figure 2: Historic and Projected Water Usage by the Combined OTC Fleet With a Redondo Beach Extension



5.3. Mitigation of Impacts to Marine Life

The OTC Policy includes a provision that existing power plants must implement measures to mitigate the interim impingement and entrainment impacts to marine life resulting from cooling water intakes during operation. This requirement commenced on October 1, 2015, and continues up to and until the owner or operator achieves final compliance. Section 2.C(3) of the OTC Policy provides options for owners or operators to demonstrate compliance with the interim mitigation requirements.

AES-Southland, Inc. (AES), owner and operator of Redondo Beach, elected to comply with the interim mitigation requirements through Section 2.C(3)(b) by providing funding to the Ocean Protection Council or California Coastal Conservancy to fund appropriate mitigation projects.

Since October 1, 2015, approximately \$1.11 million in interim mitigation funds for the Redondo Beach facility have been paid by AES to fund appropriate mitigation projects. Payments are calculated in determinations prepared by State Water Board staff on an annual basis.

The process to calculate interim mitigation payments was approved by the State Water Board on August 18, 2015, in Resolution No. 2015-0057. The State Water Board previously contracted with Moss Landing Marine Laboratory to establish an expert review panel (Expert Review Panel II) on minimizing and mitigating intake impacts from power plant and desalination facility seawater intakes. The Expert Review Panel II developed a mitigation fee for facility interim mitigation that would compensate for continued intake impacts due to impingement and entrainment, which was the basis of the interim mitigation calculation method set forth in Resolution No. 2015-0057. The interim mitigation payment calculation comprises an entrainment payment, an impingement payment, and a management payment for implementation and monitoring of the mitigation project. The entrainment fee calculation utilizes empirical transport models coupled with the habitat production forgone method, as required by the OTC Policy, and is based on the cost of creating or restoring habitat that replaces the production of marine organisms killed by entrainment.

In accordance with Resolution No. 2015-0057, interim mitigation payments are calculated annually for each individual OTC facility, comprising the elements discussed above. The entrainment calculation is based on the volume of OTC water used during the annual interim mitigation period multiplied by either a site-specific or default average cost of entrainment determined in the Expert Review Panel II's Final Report. Resolution No. 2015-0057 states that when site-specific entrainment data is available for a facility, the Executive Director of the State Water Board shall determine whether this data is suitable for calculating a specific habitat production forgone for that plan. Otherwise, owners and operators electing to comply with interim mitigation requirements consistent

with Section 2.C.(3)(b) use the default method for calculating the entrainment component of the interim mitigation calculation. Each site-specific or general entrainment rate is multiplied by a 3 percent escalator each year to update the average cost of entrainment to account for inflation. The impingement calculation is based on the pounds of fish impinged during the annual interim mitigation period multiplied by the average indirect economic value of the fisheries. The management and monitoring payment is calculated by taking 20 percent of the sum of the entrainment and impingement calculations.

The interim mitigation period commenced on October 1, 2015, and owners or operators are required to satisfy interim mitigation requirements until the OTC facilities achieve final compliance with the OTC Policy. Continued interim mitigation requirements apply if there are compliance date extensions.

Accordingly, the continued use of OTC waters from Redondo Beach will be subject to continued interim mitigation requirements as detailed in Resolution No. 2015-0057 up to and until the power plant comes into compliance with the OTC Policy. The interim mitigation requirements currently in place are sufficient to offset impingement and entrainment impacts incurred during the operation of Redondo Beach through 2021 or 2023.

5.4. Land Use Impacts

The 2010 Final SED concluded that no land use impacts were identified regarding OTC power plant compliance with requirements of the OTC Policy. This conclusion was based on the 2008 report by Tetra Tech, which evaluated the technical and logistical feasibility of retrofitting 15 of the state's fossil-fueled coastal OTC power plants with closed-cycle wet cooling systems (pages 104 and G-229, 2010 Final SED). Revisions to OTC Policy compliance dates based upon non-marine impacts to local communities, including land use concerns and environmental justice, may be considered but are largely beyond the scope of the State Water Board's authority under CWA section 316(b) and the OTC Policy.

Starting in 2018, AES entered negotiations for the sale of the Redondo Beach property to developer SLH Fund, LLC (SLH). At the time of the adoption of the 2020 OTC Policy amendment, an agreement was in place for AES to lease back the property and continue operating Redondo Beach if the power plant's compliance date was extended by the State Water Board. In its May 18, 2020 comment letter to the State Water Board on the 2020 OTC Policy amendment, SLH stated that during any extension of the power plant's compliance date, AES would provide it access to unused portions of the site for remediation, and that continuing operation of the power plant would not delay redevelopment efforts. The State Water Board is not party to negotiations or agreements between Redondo Beach's owner and operator and the land holder, and

State Water Board staff is unaware of the current status of the agreement between SLH and AES.

In 2019, the City of Redondo Beach received a grant from the California Natural Resources Agency (CNRA) for \$4.8 million for the partial purchase of 15 acres of the Redondo Beach property, including historical wetlands, for restoration as part of a regional park. In 2020, the CNRA confirmed that the power plant's compliance date extension beyond December 31, 2020, would not affect this grant funding for the City of Redondo Beach. The CNRA has since informed the State Water Board this grant was terminated in January 2021, due to circumstances unaffiliated with the 2021 OTC Policy amendment that is under consideration.

In 2015, the Coastal Commission confirmed jurisdictional wetlands exist in the former tank basin area on the Redondo Beach property, totaling 5.93 acres. In 2017 and 2018, AES submitted applications for and received three emergency coastal development permits to dewater the former tank basin and was denied a fourth. The pumping, or dewatering, occurred due to safety concerns regarding water near utility and electrical lines. Sometime before May 2020, AES stopped using the groundwater pumping system and installed portable sump pumps in utility vaults. However, pumping continued due to similar safety concerns regarding water near utility and electrical lines.

The Coastal Commission issued a Notice of Violation (NOV) to AES and SLH on May 26, 2020, for illegally dewatering the wetlands through the unpermitted installation and use of groundwater pumps in the former tank basin area and the installation and use of new portable pumps to dewater utility vaults that may be hydrologically connected to the wetlands in the former tank basin. The Coastal Commission has indicated that AES has since complied with the violation and completed the following actions to address the NOV:

- AES ceased any unpermitted dewatering of the former tank basin area;
- AES submitted by June 30, 2020, a complete coastal development permit application to the City of Redondo Beach seeking authorization to remove the dewatering system in the former tank basin and either retain or remove the vault pumping system, and;
- AES submitted to the City of Redondo Beach and the Coastal Commission by June 30, 2020, a response to information requests in the NOV related to the vault pumping system.

According to information provided by the Coastal Commission, AES' coastal development permit application submitted by June 30, 2020, provided alternatives to dewatering the former tank basin. The City of Redondo Beach, which administers a Local Coastal Program, is in the process of reviewing the alternatives submitted.

This amendment does not impede the State Water Board or the Coastal Commission from acting according to their individual responsibilities and legal requirements. The Coastal Commission will continue its role in ensuring that the facility is operated in compliance with all applicable laws and regulations.

5.5. Air Quality, Noise, and Aesthetic Impacts

Extending the compliance date of Redondo Beach will extend existing air, noise, and aesthetic impacts; however, impacts are expected to remain less than the baseline condition established in the 2010 Final SED.

Noise and aesthetic impacts related to compliance with the OTC Policy were determined to be less than significant in the 2010 Final SED.

The State Water Board found in the 2010 Final SED that it could not accurately assess air quality impacts related to compliance with the OTC Policy because it was difficult to estimate the method of compliance owners and operators would select for each power plant. However, continued operation of Redondo Beach is not expected to result in air impacts greater than those reported as baseline air emissions in Section 2.6 of the 2010 Final SED.

To date, most OTC owners and operators have elected to comply with the OTC Policy by retiring the OTC units. Some OTC sites have been repowered with new, more efficient combined-cycle gas turbines to replace retired capacity. Due to the combination of OTC unit retirements in a phased schedule and replacement of capacity with newer, more efficient resources that produce fewer emissions, as was investigated as a potential compliance scenario in the 2010 Final SED, implementation of the OTC Policy is expected to show a modest reduction of existing air quality impacts caused by operation of OTC units as compared to baseline conditions.

The State Water Board may consider air quality issues; however, the State Water Board is primarily responsible for implementing section 316(b) of the Clean Water Act. The State Water Board relies upon the agency representatives within the SACCWIS to inform recommendations on grid reliability and extensions of compliance dates for existing OTC facilities. The SACCWIS recommendations were informed by CPUC proceedings to avoid forecasted shortfalls in energy supplies. Revisions to OTC Policy compliance dates based upon non-marine impacts to local communities, including air quality, may be considered but are largely beyond the scope of the State Water Board's authority under CWA section 316(b) and the OTC Policy.

Air Quality Regulations

There are air quality and environmental justice concerns regarding pollution from Redondo Beach into the air basin and the potential impacts this may have on human

health. All operating power plants producing emissions are permitted to run by local air quality management districts, which require scheduled monitoring and reporting from the operators to ensure compliance and public safety. Redondo Beach is located in the South Coast Air Quality Management District (South Coast AQMD). The Air Toxics Hot Spots Information and Assessment Act (see California Health and Safety Code Section 44360(b)(2)) requires facilities to do a health risk analysis every four years to determine whether citizens will be exposed to any harmful pollutants. Facilities additionally conduct toxic emissions evaluations as required by the South Coast AQMD. If there is a visible pollution event, there are guidelines and permit regulations in place to account for these emissions.

As Redondo Beach is expected to continue to be used like a peaker plant, air emissions are expected to be at or below recent levels, which are typically within permitted limits.

As of April 2021, Redondo Beach is in compliance with all permits and local, regional, and state regulations that were developed to be protective of human health including ambient air quality standards and Title V of the federal Clean Air Act, which created an operating permits program implemented by the states.

In 2020, Redondo Beach had a total of 65 start-up events; Unit 5 had 21 start-ups, Unit 6 had 31 start-ups, and Unit 8 had 13 start-ups. Normally, unit start-up does not result in visible emissions, such as black smoke. However, mechanical failures have caused visible emissions during unit start-up or during operation generally one to two times a year. Generally, visible emissions resulting from nonoptimal operating conditions last between one and eight minutes. These situations typically result from an imbalance in the fuel-air mixture that feeds Redondo Beach's units, which may be caused by an electrical system or other minor equipment failure that affects the air induction system. South Coast AQMD has not indicated any reports of visible emissions from AES in 2021 thus far.

The latest incidence of visible emissions (black smoke) at Redondo Beach occurred on July 25, 2019, and was the result of the breakdown of a fan feeding oxygen to Unit No. 6. The breakdown was rectified, and the event stopped in eight minutes. The resulting investigation indicated that a fan was unexpectedly tripped on Unit 6, and the loss of oxygen caused the unit to emit dark, black smoke for approximately six minutes. The fan was manually reset, and the operation of the unit was temporarily reduced before it was brought to full load again. This visible emission event did not result in an NOV and Redondo Beach has not received any NOVs for excess emissions in the past 10 years. While no NOVs were issued, the facility received a Notice to Comply in August 2020, when a calibration of the ammonia flow meter was conducted after the due date.

While no breakdowns were reported during the 2020 compliance year, AES reported two Title V deviations at the Redondo Beach facility. Title V deviations occur when a

facility fails to comply with a term(s) in its permit, and they may or may not result in violations. The first deviation reported by AES occurred when the V-cone pressure transmitter on Device D23 failed and was stuck at full output from December 16, 2019, to March 21, 2020. This deviation is currently being evaluated by South Coast AQMD enforcement staff. The second deviation reported by AES occurred on July 31, 2020, when a fuel-to-air ratio imbalance resulted in Device D23 smoking intermittently for approximately 35 minutes. This event was not observed by South Coast AQMD enforcement staff and thus a violation could not be determined.

The South Coast AQMD's Regional Clean Air Incentives Market program regulates air pollution within an enclosed "bubble" surrounding a facility and provides an economic incentive for each facility to meet their target for annual emission reductions of nitrogen oxides and sulfur oxides. As of April 2021, the South Coast AQMD's Compliance Year 2020 audit is in progress and any compliance issues, separate from other permits and local, regional, and state regulations, will be evaluated when the process is finalized.

As stated in the 2021 SACCWIS Report, South Coast AQMD plans to amend Rule 1135 in 2021 to remove the ammonia emission limits for electric generating units with catalytic control; add start-up, shutdown, and tuning provisions; and align the monitoring, reporting, and recordkeeping requirements to South Coast AQMD Rules 218 through 218.3, which establish requirements for the installation and operation of the continuous emission monitoring system. South Coast AQMD does not foresee any impacts to OTC power plant operations from this amendment and OTC electric generating units will continue to reference the ammonia limits and follow the start-up, shutdown, and tuning provisions required in their South Coast AQMD permits. For the continuous emission monitoring system requirements, OTC units will reference South Coast AQMD Rule 218 series which requires modest software modifications.

Greenhouse Gas Emissions

CARB has indicated that it is committed to meeting the state's climate change goals through the implementation of multiple complementary policies. In accordance with SB 350, CARB's 2017 Climate Change Scoping Plan sets a variety of actions to meet the 2030 greenhouse gas target of 40 percent below 1990 emission levels, including setting emission targets for the general electricity sector and specific targets for each electricity provider. To meet these targets, large electricity providers are required to develop and submit integrated resource plans that detail how the utility will meet their customer's resource needs, reduce greenhouse gas emissions, and ramp up deployment of renewable and zero-carbon resources. CARB evaluates and revises these targets each integrated resource planning cycle to accommodate shifts in load-share between electricity providers and the formation of new entities.

Additionally, in 2013, the state implemented a Cap-and-Trade Program which places a firm, declining cap on primary sources of greenhouse gas emissions including large power plants, importers of electricity, and large industrial facilities. These businesses may comply by either reducing emissions or acquiring a limited number of tradable emissions allowances. In November 2020, CARB announced that all businesses covered by the Cap-and-Trade Program fully met their compliance obligations for covered 2019 greenhouse gas emissions. AES will continue to be responsible for ensuring it meets its Cap-and-Trade greenhouse gas emissions compliance obligations as well as its integrated resource planning greenhouse gas targets.

Air Quality and COVID-19

At the time of the adoption of the 2020 OTC Policy amendment, there was concern that potential pollution from a facility like Redondo Beach could make individuals more susceptible to COVID-19 or worsen COVID-19 symptoms. CARB does not currently have any data explicitly linking emissions from power plants to instances of COVID-19 in California. However, CARB is ramping-up its research efforts to better understand associations between COVID-19, air quality, and health; staff are currently collecting data on changes in air quality, traffic counts, vehicle miles traveled, and freight activity since the COVID-19 stay-at-home orders commenced.

CARB is also funding two ongoing health studies, both approved by CARB's Research Screening Committee and the Board, to address the COVID-19 pandemic. One study is a California-specific version of the 2020 nationwide Harvard study released in April 2020, considering the role of air pollution in COVID-19 health outcomes. The expected completion date for this statewide study is within a 2-year timeframe. The second study uses data from Kaiser Permanente Southern California to study the linkage between air pollution and COVID-19 disease progression in Southern California residents. This study is also expected to be completed within a 2-year time frame.

5.6. Other Regulatory and Permitting Requirements

The NPDES permit and associated Time Schedule Order (TSO) issued to Redondo Beach by the Los Angeles Regional Water Board will expire on September 30, 2021, and December 31, 2021, respectively. Upon submission of a complete Report of Waste Discharge, the NPDES permit may be administratively extended until the adoption of a new order; however, no additional time could be given to Redondo Beach to comply with certain final effluent limitations in this NPDES permit unless a revised TSO is adopted by the Los Angeles Regional Water Board. The Los Angeles Regional Water Board could develop a revised TSO for Redondo Beach concurrently with the OTC Policy amendment that is under consideration.

6. Analysis of Alternatives

This section presents alternatives of the amendment to the OTC Policy under consideration.

- **Alternative 1 – Preferred** – Amend the OTC Policy to extend the compliance date for Redondo Beach by two years from December 31, 2021, to December 31, 2023.
- **Alternative 2** – Amend the OTC Policy to extend the compliance date for Redondo Beach by one year from December 31, 2021, to December 31, 2022.
- **Alternative 3** – No action. Redondo Beach would stop using ocean water for once-through cooling on or before December 31, 2021. California may experience black-outs or brown-outs during times when electrical demand is high and imports are unreliable due to similar high demands in other states or balancing authority areas.

OTC Policy Amendment Preferred Alternative

The State Water Board is considering an amendment to the OTC Policy consistent with Alternative 1, to extend the compliance date for Redondo Beach for two years until December 31, 2023. The need to extend Redondo Beach to address system grid reliability concerns is supported by the SACCWIS recommendation, the information in the 2021 SACCWIS Report, and the information in this Staff Report.

7. Addendum to the 2010 Final SED

CEQA applies to a governmental action that could cause a significant effect on the environment, defined as “a substantial adverse change in the physical conditions which exist in the area affected by the proposed project.” (Cal. Pub. Resources Code § 21068; Cal. Code Regs., tit. 14, § 15002, subd. (b), (g).) The State Water Board adopted CEQA regulations at Title 23, California Code of Regulations, sections 3720-3782 to set forth rules and procedures that apply for environmental review of actions subject to the Board’s certified regulatory process. These regulations require the State Water Board to evaluate potential environmental impacts associated with adopting the OTC Policy. In 2010, the State Water Board certified a substitute environmental document in accordance with these regulations, which at that time required a written report containing the following:

- (1) a brief description of the proposed activity;
- (2) reasonable alternatives to the proposed activity; and
- (3) mitigation measures to minimize any significant adverse environmental impacts

of the proposed activity.

(Title 23, California Code of Regulations, § 3777, subd. (a) (2010))

The State Water Board revised its CEQA regulations in 2011. The revisions provide more detail on the requirements for a substitute environmental document, which now must include the following:

- (1) A brief description of the proposed project;
- (2) An identification of any significant or potentially significant adverse environmental impacts of the proposed project;
- (3) An analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts; and
- (4) An environmental analysis of the reasonably foreseeable methods of compliance. The environmental analysis shall include, at a minimum, all of the following:
 - (A) An identification of the reasonably foreseeable methods of compliance with the project;
 - (B) An analysis of any reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance;
 - (C) An analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and
 - (D) An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance.

(Title 23, California Code of Regulations, § 3777, subd. (b). (eff. 2/18/11))

The State Water Board regulations governing CEQA compliance do not apply when the Board determines that the activity is not subject to CEQA. Title 23, California Code of Regulations, § 3720, subd. (b).

The State Water Board conducted a programmatic analysis to assess the potential for adverse environment impacts that could be caused by requiring power plant owners to comply with the OTC Policy by employing one or more of the reasonably foreseeable compliance methods. To assess any potential effects, the State Water Board looked to the environmental setting, the physical conditions in the vicinity of the project as they existed at the time of the assessment. These physical conditions are often referred to as the “baseline” and are used to compare the existing physical environment with conditions that may result from approving the project. Tit. 14 Cal. Code Regs., Section

15125. The CEQA baseline is interpreted to include previously existing development and activities. (*Citizens for East Shore Parks v. State Lands Commission* (2011) 202 Cal.App.4th 549, 560.)

The 2010 Final SED for the OTC Policy describes and evaluates potential environmental impacts associated with installation of better technologies, closed-cycle wet cooling or equivalent, and potential mitigation measures for impacts associated with installation or use of those technologies. Because all OTC facilities affected by the OTC Policy were operating at the time of the 2010 Final SED, impacts associated with continued operation of those facilities were not analyzed as a potential impact associated with adoption of the OTC Policy or with reasonably foreseeable methods of compliance with the OTC Policy. Instead, impacts associated with operation of the affected power plants were considered as part of the environmental setting, or baseline against which to assess the effects of requiring compliance with the OTC Policy. Continued operation of the power plants did not constitute a substantial adverse change in the physical conditions existing at the time the OTC Policy was adopted.

The State Water Board included compliance schedules for each of the affected power plants and convened the SACCWIS to advise on energy needs affecting those compliance schedules. This was part of the original OTC Policy adoption, in order to prevent disruptions in electricity reliability as the OTC Policy was implemented. In planning the compliance schedule, the State Water Board was not required to evaluate the environmental effects of allowing plants to continue operation for differing numbers of years, since that operation was part of the baseline against which adoption of the OTC Policy was measured to determine its potential environmental effects.

The decision to extend specific compliance dates for purposes of grid reliability continues the baseline environmental setting that existed absent the OTC Policy. In addition, because the OTC Policy as adopted and as analyzed in the 2010 Final SED includes the potential for compliance date extensions, any new extension is a part of the project as originally analyzed. Extending a compliance date is not a new, independent action that requires CEQA analysis. Moreover, the proposal to extend the deadline for Redondo Beach does not constitute a project within the meaning of CEQA, because it continues the status quo and does not result in any direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment.

Nonetheless, the State Water Board prepared an addendum in order to provide new information regarding energy demand and operation of affected power plants. An addendum to a previously certified environmental impact report or equivalent such as a substitute environmental document is appropriate if some changes or additions are necessary but none of the conditions requiring preparation of a subsequent environmental document have occurred. (Tit. 23, Cal Code Regs., § 15164.) The

conditions requiring preparation of a subsequent environmental document are those where the lead agency determines, on the basis of substantial evidence in light of the whole record, one or more of the following:

- (1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
- (2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
- (3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
 - (A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
 - (B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
 - (C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
 - (D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

(Title 14, Cal. Code of Regs., § 15162, subd. (a).)

These conditions have not been met. The compliance date extension is not a substantial change in the project, as compliance date extensions for grid reliability were part of the original project. There are no identified substantial changes with respect to the circumstances under which the project is undertaken that would involve new significant environmental effects resulting from compliance with the OTC Policy, as opposed to continued operation as per baseline conditions, nor are there significant effects of reasonably foreseeable methods of compliance with the OTC Policy that were

not discussed previously or are shown to be substantially more severe than previously demonstrated. Finally, no new information has been identified that was not known at the time the Final 2010 SED was certified and that would show the compliance date extension to involve new significant effects or substantially more severe significant effects resulting from OTC Policy compliance or involve mitigation measures or alternatives previously found not feasible or different from those analyzed. Because these conditions have not been met, the preparation of a subsequent substitute environmental document is not necessary. Therefore, an addendum is appropriate, in order to reflect the changes or additions described below.

Section 5.1 above describes new developments concerning the need for continued operation of Redondo Beach to ensure grid reliability. This includes the CPUC proceedings, the root cause analysis, and the stack analysis reflecting potential shortfalls in 2022 and uncertainties in 2023 due to shifts in energy supply and demand. Section 5.2 of this Staff Report, including Figure 1 and 2, provides new information regarding projected ocean and estuarine water used for once-through cooling statewide. Daily average OTC water use on a statewide scale is projected to be at or below design flow rates from the original OTC Policy compliance schedule when the Policy was adopted in 2010.

OTC water use is associated with the amount of time a facility is actively operating. Air quality and noise impacts are also associated with active operation. Therefore, air quality and noise impacts on a statewide scale are projected to be at or below the impacts expected under the original OTC Policy compliance schedule.

Following is a summary of the major findings of the 2010 Final SED, together with further updated information and related regulatory developments.

7.1. Water Quality and Biological Resources

The 2010 Final SED concluded that less than significant (where the effect will not be significant and mitigation is not required) to no environmental impacts would result from implementation of the evaluated reasonably foreseeable methods of compliance with the OTC Policy. The State Water Board evaluated potential changes in effluent limitations in the case of installation of cooling towers to comply with the OTC Policy. While Redondo Beach was deemed ineligible for retrofit to a closed-cycle wet cooling system because of its centralized location in the heart of Redondo Beach (which would inhibit the construction of wet cooling towers), Redondo Beach Unit 7 complied with the OTC Policy on September 30, 2019, and retired at approximately the same time. Redondo Beach Units 5, 6, and 8 continue to operate, but impacts are at or below the baseline established at the time of the adoption of the 2010 Final SED, as described above.

There were considered to be no water quality impacts from the OTC Policy associated with Redondo Beach at the time of the adoption of the 2010 Final SED. Additionally, complying with the OTC Policy was determined to result in no impacts to water quality beyond the established baseline at Redondo Beach.

Although the OTC Policy implementation does not result in impacts to water quality, the Los Angeles Regional Water Quality Control Board continues to develop regulatory requirements to address ongoing impairments within the receiving water. The State Water Board's California CWA section 303(d) list classifies Santa Monica Bay (Offshore and Nearshore, including Redondo Beach and King Harbor) as impaired. The pollutants of concern include: Dichlorodiphenyltrichloroethane, or DDT (tissue and sediment); Polychlorinated biphenyls, or PCBs (tissue and sediment); sediment toxicity, debris, and fish consumption advisory (due to DDT and PCBs). The inclusion of Santa Monica Bay on the 2012 CWA section 303(d) list documents the waterbody's lack of assimilative capacity for the pollutants of concern.

Thus, the U.S. EPA established the Santa Monica Bay Total Maximum Daily Loads (TMDL) for DDTs and PCBs on March 26, 2012. The TMDL includes waste load allocations for DDTs and PCBs for point sources, including Redondo Beach, which are equal to the Ocean Plan objectives for the protection of human health. The Los Angeles Regional Water Board developed water quality-based effluent limitations for DDTs and PCBs on the basis of the waste load allocations. The Los Angeles Regional Water Board developed water quality-based effluent limits pursuant to 40 C.F.R section 122.44(d)(1)(vii), which does not require or contemplate a reasonable potential analysis.

On June 9, 2016, the Los Angeles Regional Water Board adopted Order R4-2016-0222, which renewed the waste discharge requirements for Redondo Beach. Order R4-2016-0222 serves as a permit under the NPDES (NPDES No. CA0001201) Program and regulates the discharge of the pollutants at Redondo Beach. Prior to the adoption of Order R4-2016-0222, on January 20, 2016, AES submitted a written request to the Los Angeles Regional Water Board for additional time to achieve compliance with certain new effluent limitations contained in Order R4-2016-0222. Based on the monitoring data, the Regional Water Board found that interim effluent limitations were appropriate for temperature, pH, copper, and nickel. Thus, on June 9, 2016, the Regional Water Board adopted TSO R4-2016-0223 concurrently with the adoption of Order R4-2016-0222. TSO R4-2016-0223 included interim effluent limitations for temperature, pH, copper, and nickel at the King Harbor Discharge Point (Discharge Point 002), which is considered an enclosed bay by the Los Angeles Regional Water Board. On August 24, 2017, AES submitted a written request for additional time to achieve compliance with the new effluent limitations contained in Order R4-2016-0222. Based on the monitoring data, the Regional Water Board found that interim effluent limitations were appropriate for DDT at the Pacific Ocean (Discharge Point 001) and Discharge Point 002. On

November 30, 2017, the Executive Officer issued TSO R4-2016-0223-A01 that amended TSO R4-2016-0223 to include interim limitations for DDT at Discharge Points 001 and 002.

In 2018 and 2020, TSO R4-2016-0223-A01 was amended to modify compliance deadlines due to the associated OTC Policy compliance date extension of Redondo Beach to support grid reliability. At present, the TSO requires AES to comply with final effluent limitations for DDT, temperature, pH, copper, and nickel by December 31, 2021. The Los Angeles Regional Water Board could develop a revised TSO for Redondo Beach concurrently with the OTC Policy amendment.

Further, AES intends to retire all OTC units at Redondo Beach by the compliance dates adopted by the State Water Board, which will significantly reduce OTC-related impacts to marine life and water quality from the baseline conditions established in the 2010 Final SED.

7.2. Utilities and Service Systems

Impacts to the electrical grid due to implementation of the OTC Policy were considered to be less than significant with mitigation. Disruptions to utility services and grid reliability would be most effectively mitigated by establishing a statewide policy that included provisions to consult with the state's energy agencies and coordinate implementation among the Regional Water Boards. The SACCWIS monitors statewide grid reliability to identify potential electrical shortages potentially brought about by implementation of the OTC Policy. Due to the potential for projected electrical shortfalls in 2022 and uncertainty in 2023, the SACCWIS, in its March 26, 2021 SACCWIS Report, recommended the State Water Board consider extending the compliance date for Redondo Beach Units 5, 6, and 8 for two additional years until December 31, 2023.

7.3. Air Quality

The State Water Board evaluated potential impacts to air quality in three scenarios assuming that all OTC units deemed feasible are retrofitted to either closed-cycle wet cooling or closed-cycle dry cooling systems and new combined-cycle generation or increased capacity at retrofitted OTC units replaces the nuclear OTC units at Diablo Canyon Nuclear Power Plant and San Onofre Nuclear Generating Station. It was determined that air quality impacts related to complying with the OTC Policy could not accurately be assessed because it was difficult to estimate the method of compliance owners and operators would select for each power plant. The 2010 Final SED concluded that complying with the OTC Policy with a combination of OTC unit retirements and replacement of capacity with newer, more efficient resources that produce fewer emissions would be expected to show no change to a modest reduction of existing baseline air quality impacts caused by operation of OTC units.

7.4. Aesthetics and Noise

Noise and aesthetic impacts related to compliance with the OTC Policy were determined to be less than significant in the 2010 Final SED. If cooling towers were installed as a method of compliance with the OTC Policy, appropriate mitigation would be required to offset aesthetic and noise impacts.

This amendment would not affect the identified reasonably foreseeable methods of compliance with the OTC Policy, nor would it result in any new significant environmental impacts or a substantial increase in the severity of previously identified significant effects beyond what was identified in the 2010 Final SED, as illustrated by the above discussion. Therefore, continued operation of Redondo Beach under its current operational configuration does not constitute a change in the physical environment relative to the baseline identified in the 2010 Final SED and does not require subsequent or supplemental environmental analysis.

8. Water Code Section 13140 and Other Required Considerations

8.1. Economic Analysis

The 2010 Final SED provides information on the costs of compliance with the OTC Policy. An extension of the compliance date for Redondo Beach is anticipated to result in some cost to the owner and operator for maintaining trained staff and resources to continue operations and interim mitigation payments through December 31, 2023. These costs are considered as cost of compliance with the OTC Policy and are consistent with those discussed in the 2010 Final SED.

8.2. The Human Right to Water

Once-through cooling water use is not included in Resolution No. 2016-0010, which adopted the human right to water as a core value of the State and Regional Water Boards. The primary goal of the OTC Policy is to protect marine life from the harmful impacts of impingement and entrainment associated with the use of cooling water intake structures. Therefore, the directives of Resolution No. 2016-0020 are not applicable to this amendment to the OTC Policy that is under consideration.

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