California State Lands Commission

PART III – FINAL SUPPLEMENTAL EIR

Final Supplemental Environmental Impact Report for the Seawater Desalination Project at Huntington Beach: Outfall/Intake Modifications & General Lease – Industrial Use (PRC 1980.1) Amendment (State Clearinghouse No. 2001051092), October 2017

Page Intentionally Left Blank

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

	°C	degrees Celsius
	µg/L	microgram per liter
	µPa	micropascal
	µPa^{2}s	micropascal squared per second
	2010 FSEIR	2010 Final Subsequent Environmental Impact Report
	2010 Project	Huntington Beach Desalination Plant
A	AB	Assembly Bill
	ACS	American Community Survey
	AFC	Application for Certification
	APF	Area of Production Foregone
	APLC	Applicant Proposed Lease Condition
	APM	Applicant Proposed Measure
	Applicant	Poseidon Resources (Surfside) LLC
	AR5	Fifth Assessment Report
	ASBS	Area of Special Biological Significance
	AVE	Area of Visual Effect
B	BAU	business as usual
	BIG	beach infiltration gallery
	BMP	Best Management Practice
	BMZ	Brine Mixing Zone
C	CalEPA	California Environmental Protection Agency
	Caltrans	California Department of Transportation
	CARB	California Air Resources Board
	CBIA	California Building Industry Association
	CCC	California Coastal Commission
	CDFW	California Department of Fish and Wildlife
	CDP	coastal development permit
	CEC	California Energy Commission
	CEQ	Council on Environmental Quality
	CEQA	California Environmental Quality Act
	CESA	California Endangered Species Act
	CFR	Code of Federal Regulations
	cfs	Cubic feet per second
	CIP	clean-in-place
	City	City of Huntington Beach
	CNDDB	California Natural Diversity Database
	CNEL	Community Noise Equivalent Level
	CO	carbon monoxide
	CPUC	California Public Utilities Commission
	CRHR	California Register of Historical Resources
	CSLC	California State Lands Commission
	CSMW	Coastal Sediment Management Workgroup

	CUP	Conditional Use Permit
D	dB	decibel
	dBA	A-Weighted Sound Level
	Dm	minimum probable initial dilution
	DOT	U.S. Department of Transportation
	DTSC	California Department of Toxic Substances Control
E	EAP	Energy Action Plan
	EDGAR	Emission Database for Global Atmospheric Research
	EFH	Essential Fish Habitat
	EIR	Environmental Impact Report
	ETM	Empirical Transport Model
F	FESA	Federal Endangered Species Act
	FHWG	Fisheries Hydroacoustic Working Group
	ft/s	feet per second
	ft^2	square feet
	FTA	Federal Transit Administration
G	GDP	gross domestic product
	GHG	greenhouse gas
	GWP	Global warming potential
H	H2O	water
	HB	Huntington Beach
	HBGS	Huntington Beach Generating Station
	HCP	habitat conservation plan
	HFC	Hydrofluorocarbon
	Hz	Hertz
I	in	inch
	IPCC	Intergovernmental Panel on Climate Change
	IRM	Interim Removal Measure
	ISI	Intake Screen, Inc.
	ISTAP	Independent Scientific Technical Advisory Panel
	ITS	International Transportation Service
K	kg	kilogram
	kHz	kilohertz
	knot	nautical mile per hour
L	lb	pound
	LCP	Local Coastal Program
	LLC	Limited Liability Company
	LNM	Local Notice to Mariners
	LOS	level of service
	LST	localized significance threshold
M	MBI	Michael Baker International
	MBNMS	Monterey Bay National Marine Sanctuary
	mg/L	milligrams per liter
	MGD	million gallon per day

	MLD	Most Likely Descendant
	MLLW	mean lower low water
	mm	millimeter
	MM	mitigation measure
	MMP	Mitigation Monitoring Program
	MMPA	Marine Mammal Protection Act
	MND	Mitigated Negative Declaration
	MPA	Marine Protected Area
	MRDS	Mineral Resource Data System
	MW	megawatt
	MWM	marine wildlife monitor
	MXSocal	Marine Exchange Southern California
N	NAHC	Native American Heritage Commission
	NAVFAC	Naval Facilities Engineering Command Southwest
	NCCP	natural community conservation plan
	NGO	non-governmental organization
	nm	nautical mile
	NMFS	National Marine Fisheries Service
	NOAA	National Oceanic and Atmospheric Administration
	NOD	Notice of Determination
	NOP	Notice of Preparation
	NPDES	National Pollutant Discharge Elimination System
	NRC	National Research Council
	NRHP	National Register of Historic Places
O	Ocean Plan	Water Quality Control Plan for the Ocean Waters of California
	OCSD	Orange County Sanitation District
	OCWD	Orange County Water District
	OEHHA	State Office of Environmental Health Hazard Assessment
	OHWM	Ordinary High Water Mark
	OSHA	Occupational Safety and Health Administration
	OTC	once-through cooling
	OTC Policy	Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling
P	PCH	Pacific Coast Highway
	PFC	perfluorocarbon
	POLB	Port of Long Beach
	Poseidon	Poseidon Resources (Surfside) LLC
	ppt	part per thousand
	PPV	peak particle velocity
	PTS	permanent threshold shift
R	RAP	Remedial Action Plan
	REC	Renewable Energy Certificate
	RMS	root mean square
	RO	reverse osmosis

	RV	recreational vehicle
	RWQCB	Regional Water Quality Control Board
S	SB	Senate Bill
	SCAB	South Coast Air Basin
	SCAG	Southern California Association of Governments
	SCAQMD	South Coast Air Quality Management District
	SCCOOS	Southern California Coastal Ocean Observing System
	SCE	Southern California Edison
	SCH	State Clearinghouse
	SED	Substitute Environmental Documentation
	SEL	sound exposure level
	SIG	seafloor infiltration gallery
	SONGS	San Onofre Nuclear Generating Station
	SPL	sound pressure level
	SRA	source-receptor area
	State Parks	California Department of Parks and Recreation
	SWPPP	Storm Water Pollution Prevention Plan
	SWRCB	State Water Resources Control Board
T	TSS	Traffic Separation Scheme
U	UBC	Uniform Building Code
	USCG	U.S. Coast Guard
	USDOT	U.S. Department of Transportation
	USEPA	U.S. Environmental Protection Agency
	USFWS	U.S. Fish and Wildlife Service
	USGS	U.S. Geological Survey
V	VMC	Visual Modification Class
	VOC	volatile organic compounds
	VTS	Vessel Traffic Service
Z	ZID	zone of initial dilution

EXECUTIVE SUMMARY

BACKGROUND AND PROJECT LOCATION

The objective of this Executive Summary is to briefly describe the proposed *Seawater Desalination Project at Huntington Beach: Outfall/Intake Modifications & General Lease–Industrial Use (PRC 1980.1) Amendment* (**Lease Modification Project**). The Executive Summary also discusses potential significant environmental effects that may result from Lease Modification Project construction and operation, identifies mitigation measures to avoid or minimize any significant environmental effects, and evaluates alternatives to the proposed project.

The California State Lands Commission (Commission or CSLC) has prepared this Supplemental Environmental Impact Report (EIR) in accordance with the California Environmental Quality Act (CEQA; Pub. Resources Code, § 21000 et seq.). The Lease Modification Project would amend a prior Commission authorization in October 2010. The following history is relevant to understanding the scope of this Supplemental EIR.

- In September 2010, the City of Huntington Beach (City), as CEQA lead agency, certified a Final Subsequent Environmental Impact Report (2010 FSEIR) and approved the construction and operation of the 50 million gallon per day (MGD) Huntington Beach Desalination Plant (HB Desalination Plant or **2010 Project**) at a site adjacent to the AES Huntington Beach Generating Station (HBGS) in the city of Huntington Beach, Orange County.

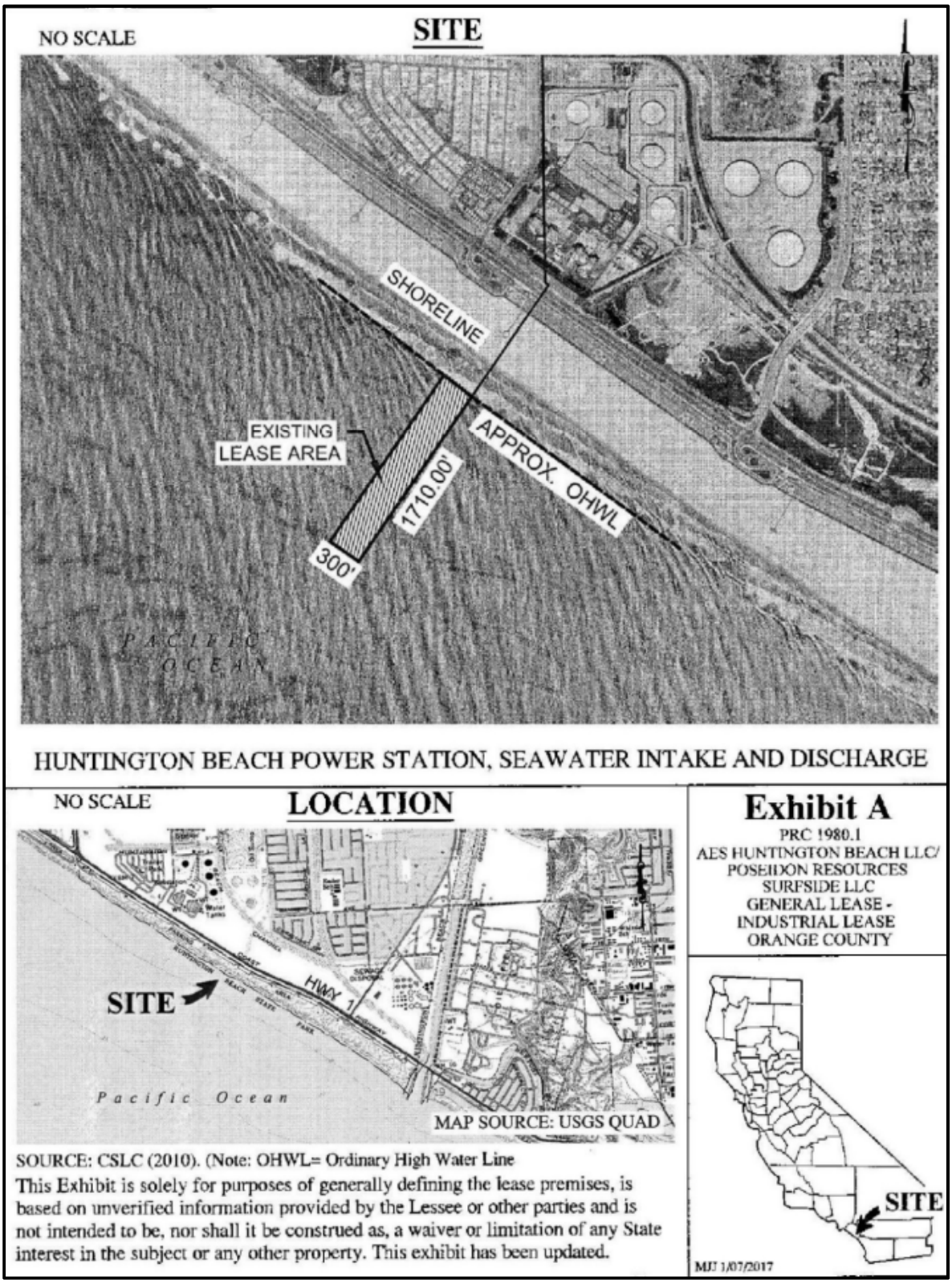
  Before the HB Desalination Plant could be built, operate, or distribute potable water, other agencies–including the Commission Santa Ana Regional Water Quality Control Board (RWQCB), California Coastal Commission (CCC), and local or regional water agencies–had to approve the portions of the 2010 Project within their respective jurisdictions.

- In October 2010, the Commission, as a CEQA responsible agency, approved an application by Poseidon Resources (Surfside) LLC (Poseidon or Applicant) to amend General Lease–Industrial Use PRC 1980.1 to use the HBGS's seawater intake and discharge pipelines for HB Desalination Plant operations (Item 62, October 29, 2010). The lease covers 11.78 acres of tide and submerged land offshore of the HBGS outside the City's jurisdiction (see Figure ES-1). Under PRC 1980.1, which has a 20-year lease term (through August 7, 2026):

  - AES remains responsible for obligations pertaining to its use of the HBGS intake and discharge pipelines for once-through cooling (OTC) (i.e., to withdraw and discharge seawater used to cool the power plant generators)

  - Poseidon has a vested right to operate the portion of the HB Desalination Plant under the Commission's jurisdiction and is responsible for obligations pertaining to the 2010 Project's use of the pipelines

Figure ES-1. Lease Modification Project Location



Note: this Figure, which was Exhibit A for the Commission's staff report in 2010 (Item 62, October 29, 2010), has been updated to correct the reference to the location of Beach Boulevard.

- In May 2015, the State Water Resources Control Board (SWRCB) adopted an amendment to the Water Quality Control Plan for the Ocean Waters of California (Ocean Plan) to address effects associated with the construction and operation of seawater desalination facilities.[1] This "Desalination Amendment" states in part:
    - If subsurface intakes are not feasible, the regional water board…shall require that surface water intakes be screened. Screens must be functional while the facility is withdrawing seawater. **(Chapter III.M.2.d(1)(c)(i).)**
    - The preferred technology for minimizing intake and mortality of all forms of marine life resulting from brine discharge is to commingle brine with wastewater (e.g., agricultural, municipal, industrial, power plant cooling water, etc.) that would otherwise be discharged to the ocean.… Multiport diffusers are the next best method for disposing of brine when the brine cannot be diluted by wastewater and when there are no live organisms in the discharge. Multiport diffusers shall be engineered to maximize dilution, minimize the size of the brine mixing zone, minimize the suspension of benthic sediments, and minimize mortality of all forms of marine life. **(Chapter III.M.2.d(a), (b).)**

In 2016, Poseidon submitted a new application to the Commission to amend General Lease–Industrial Use PRC 1980.1 to install a wedgewire screen and a multiport diffuser on the seaward end of the HBGS seawater intake and discharge pipeline, respectively, pursuant to the subdivisions of Ocean Plan Chapter III.M.2.d discussed above. In order to review Poseidon's lease amendment application in a timely manner, the Commission prepared this Supplemental EIR in its continuing role as a CEQA responsible agency. The Supplemental EIR is intended to provide the Commission with information required to exercise its jurisdictional responsibilities with respect to the Lease Modification Project, which will be considered at a separately noticed public hearing.

Poseidon continues to seek additional agency approvals, including:

- A National Pollutant Discharge Elimination System (NPDES) permit renewal/reissuance and a determination by the Santa Ana RWQCB, in consultation with the SWRCB, that the HB Desalination Plant complies with Water Code section 13142.5, subdivision (b), pursuant to the Desalination Amendment
- A coastal development permit (CDP) from the CCC (the CCC has also accepted an appeal of a 2010 City-issued CDP and expects to consider the appeal and a new CDP application from Poseidon at a future hearing)

[1] www.waterboards.ca.gov/water_issues/programs/ocean/desalination/.

The RWQCB is currently reviewing Poseidon's HB Desalination Plant application pursuant to Water Code section 13142.5, subdivision (b), which provides "[f]or each new or expanded … industrial installation using seawater for cooling, heating, or industrial processing, the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life." An alternative site, design, or technology to Poseidon's proposal and alternative and/or additional mitigation measures could result from this review (the 2010 FSEIR also considered alternatives to the 2010 Project). For example, as shown in Figure 1-4 in Section 1, *Introduction*, the RWQCB, in coordination with the SWRCB and CCC, is evaluating alternative sites to the 2010 Project, although Poseidon has not applied for any alternative site. If the RWQCB identifies a site outside the PRC 1980.1 lease boundaries pursuant to its section 13142.5, subdivision (b) determination, new or additional CEQA or CEQA functional equivalent analysis would be required.

PRIOR ANALYSES INCORPORATED BY REFERENCE

The information in this Supplemental EIR supplements, and incorporates by reference, information from the following documents:

- The 2010 FSEIR certified by the City in September 2010
- Findings of the Commission as a CEQA responsible agency pursuant to State CEQA Guidelines section 15091 (Item 62, October 29, 2010; Exhibit E1)
- *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes* (SED) (SWRCB 2015a; Exhibit E2), which analyzed impacts associated with seawater desalination facility construction and operation, including use of wedgewire screens and multiport diffusers, as part of the Desalination Amendment [2]

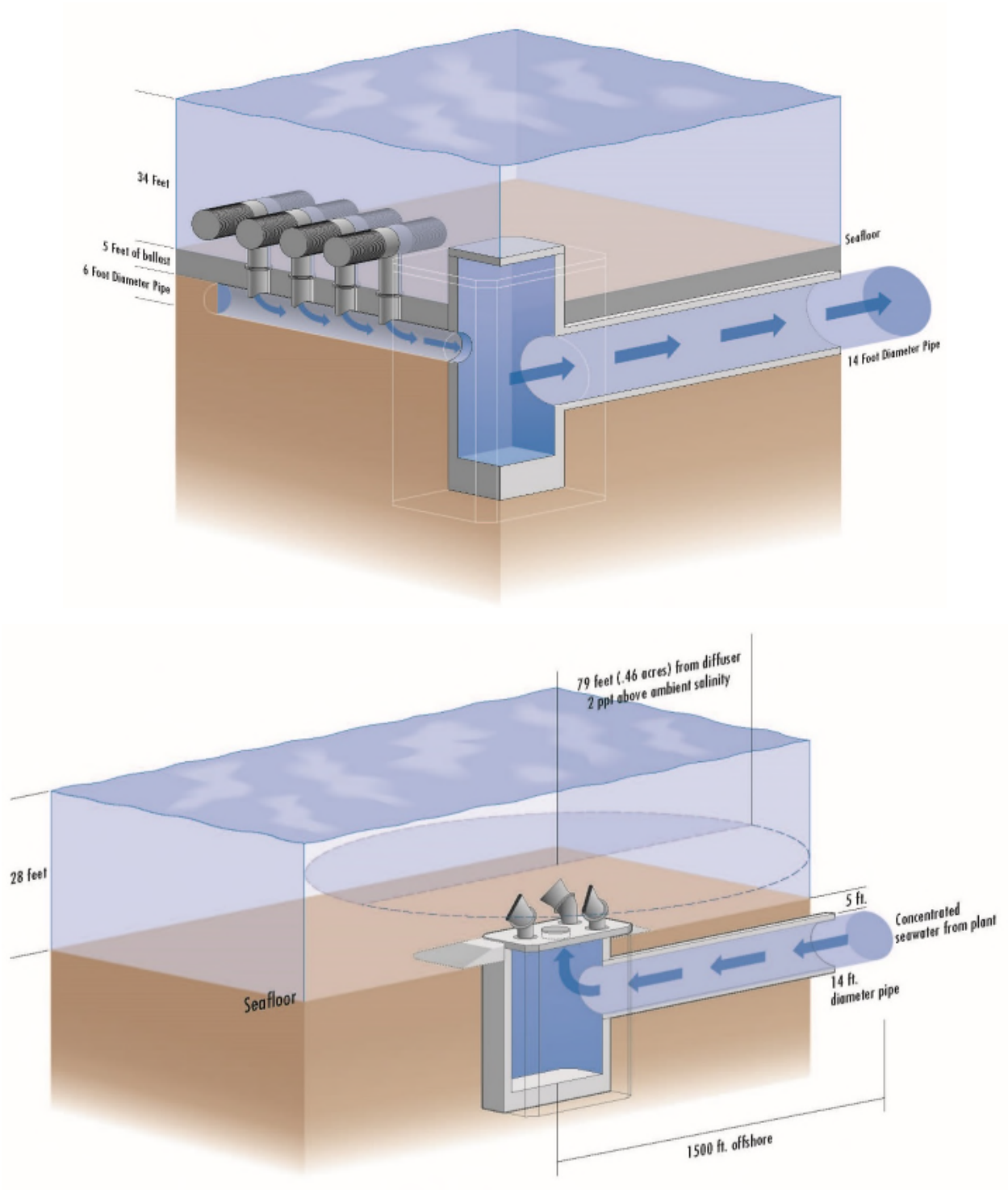
DESCRIPTION OF PROPOSED PROJECT

Pursuant to the 2010 City and Commission approvals, the HB Desalination Plant would desalinate seawater under co-located operation (the HB Desalination Plant uses OTC flow from the HBGS as source water) or stand-alone operation (after the HBGS ceases OTC and shuts down its Unit 1 and Unit 2 generators, which is scheduled by December 31, 2020). Poseidon is seeking to amend its existing Commission lease to include the following technology enhancements (see Figure ES-2) and operational modification to reduce marine mortality rates:

- Install four 1-millimeter wedgewire screens on the offshore end of the seawater intake pipeline about 1,650 feet offshore to reduce entrainment and impingement

[2] www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/rs2015_0033_sr_apx.pdf

Figure ES-~~1~~2. Lease Modification Project Wedgewire Screens and Diffuser



- Install a multiport duckbill seawater diffuser on the offshore end of the discharge pipeline about 1,500 feet offshore to enhance brine mixing with seawater
- Reduce seawater intake volume to 106.7 MGD (from a 2010 Project volume of 152 MGD)

If the RWQCB, pursuant to Water Code section 13142.5, subdivision (b), determines subsurface intakes are not feasible and brine cannot be diluted by wastewater and there are no live organisms in the discharge, ~~B~~both the multiport diffuser and wedgewire screens must be installed prior to operation of the HB Desalination Plant consistent with Desalination Amendment requirements (see Ocean Plan Chapters III.M.2.d(1)(c)(i) and III.M.2.d(a),(b)). Offshore Lease Modification Project construction activities are expected to begin in late 2019 and be carried out 7 days a week between 7 a.m. and 6 p.m. (see Table 2-4 in Section 2, *Project Description*). Installation of the diffuser system would occur first and take approximately 2 months. Installation of the wedgewire screens would occur afterwards, or concurrently, and take approximately 3 months.

SUMMARY OF PROJECT OBJECTIVES, PURPOSE, AND NEED

The State CEQA Guidelines (§ 15126.6, subd. (a)) require an EIR to describe and consider a range of reasonable alternatives to a project, or project location, which would feasibly attain most of the basic objectives of the project. Project objectives identified in the 2010 FSEIR are presented to explain the previously-approved need for the HB Desalination Plant and to guide in developing and evaluating alternatives. Consistent with the 2010 FSEIR and Poseidon's executed lease, this Supplemental EIR incorporates these objectives within the context of Poseidon's application to amend PRC 1980.1.) These objectives are:

- Use proven technology to affordably provide a long-term, local, and reliable source of water not subject to the variations of drought or regulatory constraints
- Reduce local dependence on imported water and strengthen regional self-reliance
- Contribute desalinated water to satisfy regional water supply planning goals

Poseidon's objectives also include obtaining the necessary approvals from the Santa Ana RWQCB (a determination that the HB Desalination Plant complies with Water Code section 13142.5, subdivision (b), and issuance of a ~~National Pollutant Discharge Elimination System [~~NPDES~~]~~ permit), the CCC (issuance of a CDP), and local or regional water agencies such as the Orange County Water District (OCWD).

SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Table ES-1 identifies the environmental issue areas discussed in the City's certified 2010 FSEIR, those analyzed in Section 4 of this Supplemental EIR, and those found not to be substantially affected by the Lease Modification Project.

Table ES-1. Environmental Issue Areas Analyzed

City's 2010 FSEIR (by Section No.)	**This Supplemental EIR** (by Section No.)
4.1 Land Use/Relevant Planning 4.2 Geology, Soils, and Seismicity 4.3 Hydrology, Drainage, and Storm Water Runoff 4.4 Air Quality 4.5 Noise 4.6 Public Services and Utilities 4.7 Aesthetics/Light & Glare 4.8 Hazards and Hazardous Materials 4.9 Construction Related Impacts (Hydrology and Water Quality; Air Quality; Noise; Underground Utilities; Aesthetics/Light and Glare; Hazards and Hazardous Materials; Traffic; Biological Resources; Cultural Resources) 4.10 Ocean Water Quality and Marine Biological Resources 4.11 Product Water Quality 4.12 Climate Change **<u>Effects Found Not to be Significant</u>** • Population and Housing • Mineral Resources • Agriculture and Forest Resources • Several subsections of Hazards and Hazardous Materials, Noise, and Transportation/Traffic	4.1 Ocean Water Quality and Marine Biological Resources 4.2 Aesthetics/Light & Glare 4.3 Air Quality 4.4 Cultural Resources 4.5 Cultural Resources – Tribal 4.6 Greenhouse Gas Emissions 4.7 Hazards and Hazardous Materials 4.8 Noise and Vibration 4.9 Recreation 4.10 Transportation (Marine) **<u>Other Commission Considerations</u>** 8.1 Climate Change and Sea-Level Rise 8.2 Environmental Justice **<u>No Impact/Not Significant</u> *** • Agriculture and Forestry Resources • Biological Resources (Terrestrial) • Geology and Soils • Hydrology, Drainage, and Storm Water Runoff • Land Use and Planning • Mineral Resources • Population and Housing • Public Services • Transportation/Traffic (onshore) • Utilities and Service Systems (including Product Water Quality)

* See discussion in Section 4, *Environmental Setting and Impact Analysis*.

Impacts within each affected environmental issue area are analyzed in relation to pertinent significance criteria. Impacts are classified as one of five categories.

Significant and Unavoidable	A substantial or potentially substantial adverse change from the environmental baseline that meets or exceeds significance criteria, where either no feasible mitigation can be implemented or the impact remains significant after implementation of mitigation measures
Less than Significant with Mitigation	A substantial or potentially substantial adverse change from the environmental baseline that can be avoided or reduced to below applicable significance thresholds

Less than Significant	An adverse impact that does not meet or exceed the significance criteria of a particular resource area and, therefore, does not require mitigation
Beneficial	An impact that would result an improvement to the physical environment relative to baseline conditions
No Impact	A change associated with the project that would not result in an impact to the physical environment relative to baseline conditions

Poseidon has identified one Applicant Proposed Lease Condition (APLC) to address issues raised in the 2010 FSEIR and during public scoping about the structural integrity of the discharge pipeline when operating with a diffuser or with concentrated brine flowing through it (compared to existing conditions) and ~~seven~~ eight Applicant Proposed Measures (APMs) to avoid or minimize potential impacts associated with the Lease Modification Project (see full text in Table 4-02 in Section 4, *Environmental Setting and Impact Analysis*).

APLC-1 Pipeline Integrity Assessment Inspection and Report

APM-1. Offshore Construction Best Management Practices (BMPs) to Protect Water Quality

APM-2. Turbidity Minimization and Monitoring Plan

APM-3. Spill Prevention and Response Plan

APM-4. Workers Educational Training

APM-5. Sensitive Marine Species Monitoring Plan and Best Management Practices (BMPs) to Protect Marine Biological Resources

APM-6. Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map

APM-7. Energy Minimization and Greenhouse Gas (GHG) Reduction Plan

APM-8. Composition and Maintenance of Wedgewire Screens

All but a few impacts of the Lease Modification Project, with implementation of all APMs, would be (1) Less than Significant or (2) Less than Significant with Mitigation following implementation of mitigation measures identified in this Supplemental EIR (see Table ES-3 at the end of this Executive Summary for details). However, even after all feasible MMs are applied, the Lease Modification Project is expected to have Significant and Unavoidable impacts associated with:

- Ocean Water Quality and Marine Biological Resources (see Section 4.1)
- Air Quality (see Section 4.3)

SUMMARY OF ALTERNATIVES

~~Three~~Four alternatives were selected for evaluation in this Supplemental EIR.

- **No Project Alternative.** The existing Lease would remain in effect. The impacts of the 2010 Project analyzed in the 2010 FSEIR would occur with no modifications to the pipelines to add the diffuser and wedgewire screens. Construction effects of installation would not occur.
- **Rotating Brush-Cleaned, Stainless Steel Wedgewire Screens Alternative.** Rotating wedgewire screens would be installed using the same methods as the proposed wedgewire screens that would be cleaned manually or using a boat-based air-burst method. With use of these screens, the need for manual cleaning would be ~~greatly~~ reduced.
- **Copper-Nickel Alloy Wedgewire Screen Alternative.** Stationary screens composed of a copper-nickel alloy would be installed using the same methods as the proposed wedgewire screens. While this material would reduce the rate of biofouling, the copper-nickel could leach into the surrounding water.
- **Six-Port Diffuser Alternative.** A six-port diffuser with four 42-inch and two 30-inch ports would be installed during co-located operations. The four 42-inch ports would be closed to facilitate the transition to stand-alone operations. Diffuser installation methods and intake modifications would generally be the same as the proposed Lease Modification Project.

Several alternatives were considered, but were determined to be infeasible or did not clearly offer the potential to reduce significant environmental impacts. These alternatives were screened from further evaluation in the Supplemental EIR and include the following (refer to Section 5, *Alternatives*, for explanation):

- Intake Pipeline Extension Alternative
- Four-Jet Rosette Diffuser Alternative
- Two-port Diffuser Alternative
- Alternative Site Alternative
- Alternative Ownership and Operation Alternative
- Alternative Facility Configuration
- Beach Well Intake Alternatives
- Subsurface Infiltration Gallery Intake Alternatives
- Alternative Discharge Location
- Alternative Diffuser Design – Velocity Cap with 4 Rectangular Ports
- Reduced Facility Size Alternative

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

State CEQA Guidelines section 15126.6, subdivision (e)(2), states in part that an EIR shall identify an environmentally superior alternative among the other alternatives if the environmentally superior alternative is the No Project alternative. Table ES-4 at the end of the Executive Summary compares the proposed Lease Modification Project impacts with those of the alternatives. Based on the analysis contained within the Supplemental

EIR, the CSLC has determined that the Lease Modification Project with the **Rotating Brush-Cleaned, Stainless Steel Wedgewire Screens Alternative** is the Environmentally Superior Alternative. For a more detailed comparison of the Lease Modification Project and alternatives, see Section 6, *Other CEQA Sections and Environmentally Superior Alternative*.

KNOWN AREAS OF CONTROVERSY OR UNRESOLVED ISSUES

State CEQA Guidelines section 15123, subdivision (b)(2), requires EIRs to contain a brief summary of areas of known controversy including issues raised by agencies and the public. According to the 2010 FSEIR, the Applicant has pursued the development of a seawater desalination facility at the AES HBGS site in Huntington Beach since 1999 (City 2010), and nearly 7 years after the City approved the 2010 Project, Poseidon has not obtained all its required permits to construct or operate the HB Desalination Plant.

The nature of the 2010 Project generated controversy among those who perceived a need for desalinated water and those concerned with the potential impacts of seawater withdrawal on sensitive marine biological resources, water quality and air quality, among other considerations, during project construction and operation. Many issues raised by agencies and the public during public scoping for the Lease Modification Project, which would modify the offshore pipelines associated with PRC 1980.1, address perceived changed circumstances in the past 7 years, including:

- The need for the 2010 Project in light of recent water conservation actions, demand forecasts, water availability, and energy use
- Issues that were not addressed in the 2010 FSEIR, including changes in ocean water quality regulations with adoption of the Desalination Amendment, onshore site inundation associated with sea-level rise, etc.
- Project operation and timing – whether co-located operation of the HBGS and HB Desalination Plant is feasible since the Plant may not be fully constructed and operating until after HBGS OTC operations cease (letters from Kurt Berchtold, RWQCB, and Tom Luster, CCC, to Cy Oggins, CSLC, December 21, 2016)
- The level of CEQA review for the Lease Modification Project, including the determination to prepare a Supplemental EIR and not a Subsequent EIR or new EIR, given that additional CEQA review (above that in the 2010 FSEIR) may also be needed to build a site-specific onshore system to distribute potable water

Areas of known controversy will be evaluated by the Commission in its consideration of potential significant impacts, mitigation measures, alternatives, and in any decision whether to approve the Lease Modification Project and impose lease conditions if approved. Additional discussion is provided in Section 6.4, *~~Areas of~~ Known Areas of Controversy or Unresolved Issues*.

ORGANIZATION OF SUPPLEMENTAL EIR

The Supplemental EIR is presented in nine sections as shown below:

- **Section 1 – Introduction** provides background on the Lease Modification Project and the CEQA process.
- **Section 2 – Project Description** describes the Lease Modification Project, its location, components, and activities, and describes the decommissioning process and schedule.
- **Section 3 – Cumulative Projects** describes and locates other projects that are considered in the cumulative impact assessment within Section 4.
- **Section 4 – Environmental Setting and Impact Analysis** describes existing environmental conditions, impacts of the Lease Modification Project, mitigation measures, and residual effects for multiple environmental issue areas, and evaluates cumulative impacts.
- **Section 5 – Alternatives** describes the alternatives screening methodology, alternatives screened from full evaluation, and alternatives carried forward for analysis; and analyzes impacts of each alternative carried forward.
- **Section 6 – Other CEQA Sections and Environmentally Superior Alternative** addresses other required CEQA elements, including: significant and irreversible environmental and growth-inducing impacts; comparison of the Lease Modification Project and alternatives; and identification of the environmentally superior alternative.
- **Section 7 – Mitigation Monitoring Program (MMP)** presents the required description of the monitoring process.
- **Section 8 – Other Commission Considerations** presents information relevant to the Commission's consideration of Poseidon's lease amendment application that are in addition to the environmental review required pursuant to CEQA (other considerations may be addressed in the staff report presented at the time of the Commission's consideration of the lease amendment).
- **Section 9 – Report Preparation Sources and References** lists the persons involved in preparation of the EIR and the reference materials used.

The Supplemental EIR also contains the following appendices listed below.

- **Appendix A** – Applicable Federal and State Regulations
- **Appendix B** – Interagency Permit Sequencing Framework Agreement
- **Appendix C** – EIR Distribution List

- **Appendix D** – Notice of Preparation (NOP), NOP Comments, Scoping Hearing Transcripts, and Index to Where Each NOP Comment is Addressed in the Supplemental EIR
- **Appendix E** – Selected Documents Incorporated by Reference
    - **E1** – California State Lands Commission staff report, Mitigation Monitoring Program, and Findings (Item 62, October 29, 2010)
    - **E2** – *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes* (adopted May 6, 2015) (SWRCB 2015a)
- **Appendix F** – Memorandum and Reports on ocean water quality/marine biological issues related to desalination project intake and discharge
    - **F1** – Dr. Peter Raimondi, Review of Applicant-provided information on operational effects of the Huntington Beach Desalination Plant Lease Modifications to marine biology (May 19, 2017).
    - **F2** – TWB Environmental Research and Consulting (Tim Hogan) and Michael Baker International (Dr. Scott Jenkins), Technical Memorandum: Response to SLC Request for Additional Turbulence Mortality Calculation (May 9, 2017)
    - **F3** – Comparison of Selected Southern California Tidal Wetlands as Potential Sites for Mitigation of Impacts Associated with Desalination Projects, 2016 Update (July 2016)
    - **F4** – Poseidon Huntington Beach Desalination Facility Marine Life Mitigation Plan: Bolsa Chica (July 2016)
- **Appendix G** Energy Minimization and Greenhouse Gas Reduction Plan (February 27, 2017 Update)
- **Appendix H** – Discharge Pipeline (Outfall) Technical Memoranda and Reports submitted to CSLC Engineering and Environmental Staffs
    - **H1** – Outfall Diffuser Head Loss Summaries, Calculations, and Related Memos (Alden 2017a/GHD 2017a)
    - **H2** – Response to Request for Information on Possible Effects of Adding Brine into Existing Concrete Discharge Pipeline (GHD 2017b)
- **Appendix I** – Wedgewire Screen and Diffuser Construction: Summary, Harborcraft Assumptions and Emissions, CalEEMod Summer/Annual Outputs

Table ES-3. Impact and Mitigation Summary: Lease Modification Project

Impact	Impact Class[3]	Applicant Proposed Measures / Recommended MMs
SECTION 4.1 OCEAN WATER QUALITY AND MARINE BIOLOGICAL RESOURCES		
OWQ/MB-1: Impact to Ocean Water Quality of Lease Modification Project Construction Activities	**LTS**	**APM-1**: Offshore Construction BMPs to Protect Water Quality **APM-2**: Turbidity Minimization and Monitoring Plan **APM-3:** Spill Prevention and Response Plan **APM-4**: Workers Educational Training
OWQ/MB-2: Impact to Special Status Species Populations of Intake Screen and Diffuser Installation (Not Including Underwater Noise)	**LTS**	**APM-3**: see above **APM-4**: see above **APM-5**. Sensitive Marine Species Monitoring and Best Management Practices (BMPs) to Protect Marine Biological Resources **APM-6**. Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map
OWQ/MB-3: Impact to Special Status Species Populations and Movement of Marine Mammal Species as a Result of Underwater Noise during Construction	**SU**	**APM-5**: see above **MM OWQ/MB-3a**: Vibratory Pile Driving **MM OWQ/MB-3b**: Pile Driving Work Windows **MM OWQ/MB-3c**: Soft Start
OWQ/MB-4: Spread of Invasive and Non-Native Marine Species in the Ocean	**LTSM**	**APM-5**: see above **MM OWQ/MB-4**: Prevent Introduction of Invasive Non-Native Species
OWQ/MB-5: Impact to Ocean Water Quality from Wedgewire Screen and Diffuser Operation and Maintenance	~~**SU**~~ **LTS**	**APM-1:** see above **APM-2:** see above **APM-8:** Composition and Maintenance of Wedgewire Screens
OWQ/MB-6: Impact to Special Status Species Populations of Intake Flow Reduction (Compared to 2010 Project)	**LTS**	**APM-1:** see above **APM-2:** see above **APM-4:** see above **APM-5:** see above **APM-6:** see above
OWQ/MB-7: Impact to Special Status Species Populations of Diffuser Operation	~~**SU**~~ **LTSM**	**MM OWQ/MB-7**: Develop and Implement a Diffuser-Operation Marine Life Mitigation Plan~~.~~
SECTION 4.2 AESTHETICS/LIGHT AND GLARE		
ALG-1: Visual Impacts from Offshore Construction Activities	**LTS**	None recommended
ALG-2: Creation of New Sources of Substantial Light or Glare such as Nighttime Illumination	**LTSM**	**MM ALG-2a**: Lighting Plan (Offshore Waters)

[3] Impact Class: SU = Significant and Unavoidable; LTSM = Less than Significant with Mitigation; LTS = Less than Significant; NI = No Impact

Table ES-3. Impact and Mitigation Summary: Lease Modification Project

Impact	Impact Class[3]	Applicant Proposed Measures / Recommended MMs
SECTION 4.3 AIR QUALITY		
AQ-1: Air Emissions from Construction	**SU**	**MM CON-14a**: Diesel Fuel Reduction Plan (Offshore Waters) **MM CON-14b**: Internal Combustion Engine Emissions Reduction Plan (Offshore Waters)
AQ-2 Creation of objectionable odors affecting a substantial number of people	**LTS**	None recommended
AQ-3: Consistency with Regional Air Quality Plan	**LTS**	None recommended
CMLTV-AQ-1: Cumulative Air Emissions from Construction	**SU**	**MM CON-14a**: See above **MM CON-14b**: See above
SECTION 4.4 CULTURAL RESOURCES		
CUL-1: Change in Significance of Previously Recorded Historical or Unique Archaeological Resources	**NI**	**APM-6**: See above
CUL-2: Change in Significance of Previously Unidentified Historical or Unique Archaeological Resources	**LTSM**	**MM CUL/TCR-2a:** Cultural Resource Identification During Geophysical Surveys **MM CUL/TCR-2b:** Discovery of Previously Unidentified Cultural or Tribal Cultural Resources
CUL-3: Construction or operation of the Lease Modification Project could damage or destroy paleontological resources	**LTS**	**APM-6**: see above
CUL-4: Disturb Unidentified Human Remains	**LTSM**	**MM CUL-4/TCR-4**: Appropriate Treatment of Human Remains
SECTION 4.5 CULTURAL RESOURCES—TRIBAL		
TCR-1: Change in Significance of Previously Recorded Tribal Cultural Resources	**NI**	None recommended
TCR-2: Change in Significance of Previously Unidentified Tribal Cultural Resources	**LTSM**	MM CUL/TCR-2a: See above MM CUL/TCR-2b: See above **MM CUL-4/TCR-4**: See above
SECTION 4.6 GREENHOUSE GAS EMISSIONS		
GHG-1: GHG Emissions from Project Activities	**LTS**	**APM-7.** Energy Minimization and Greenhouse Gas Reduction Plan
GHG-2: Consistency with Applicable GHG Plan, Policy, or Regulation	**LTS**	None recommended
SECTION 4.7 HAZARDS AND HAZARDOUS MATERIALS		
HAZ-1: Construction and Operation Impacts of Routine Hazardous Material Transport, Use, or Disposal	**LTS**	None recommended
HAZ-2: Release of Hazardous Materials through Reasonably Foreseeable Upset and Accident Conditions	**LTSM**	**APM-3**: see above **MM HAZ-1:** Prepare for Inclement Weather Condition

Table ES-3. Impact and Mitigation Summary: Lease Modification Project

Impact	Impact Class[3]	Applicant Proposed Measures / Recommended MMs
SECTION 4.8 NOISE AND VIBRATION		
NOI-1. Construction and Operation Impacts in Excess of Applicable Community Noise Standards.	**LTS**	No new measures recommended. Less than significant impacts would remain so with implementation of the following measures identified in the 2010 FSEIR: **MM CON-15**: Construction and Noise Reduction **MM NOI-1**: Outdoor Pump Noise Reduction
NOI-2: Vibration Impacts to Sensitive and Recreational Receptors	**LTS**	None recommended
NOI-3: Construction Noise Impacts in Excess of Ambient Noise Levels	**LTS**	No new measures recommended. Less than significant impacts would remain so with implementation of the following measure identified in the 2010 FSEIR: **MM CON-15**: See above
SECTION 4.9 RECREATION		
REC-1: Impacts to Recreation and Recreational Access from Lease Modification Project Activities.	**LTS**	No new measures recommended. Less than significant impacts would remain so with implementation of the following measure identified in Section 4.10, Transportation (Marine). **MM TRM-1**: See below
SECTION 4.10 TRANSPORTATION (MARINE)		
TRM-1: Marine Vessel Safety	**LTSM**	**MM TRM-1.** Publication of U.S. Coast Guard (USCG) Local Notice to Mariners

Table ES-4. Impact Summary: Lease Modification Project and Alternatives

Impact	Impact Class[4]				
		ALTERNATIVES			
	Lease Modification Project*	No Project (2010 Project)	Rotating Brush-Cleaned Stainless Steel Wedgewire Screen	Copper-Nickel Alloy**	Six-Port Diffuser *
SECTION 4.1 OCEAN WATER QUALITY AND MARINE BIOLOGICAL RESOURCES					
OWQ/MB-1: Impact to Ocean Water Quality of Lease Modification Project Construction Activities	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
OWQ/MB-2: Impact to Special Status Species Populations of Intake Screen and Diffuser Installation (Not Including Underwater Noise)	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
OWQ/MB-3: Impact to Special Status Species Populations and Movement of Marine Mammal Species as a Result of Underwater Noise during Construction	**SU**	**NI**	**SU**	**SU**	**SU**
OWQ/MB-4: Spread of Invasive and Non-Native Marine Species in the Ocean	**LTSM**	**NI**	**LTSM**	**LTSM**	**LTSM**
OWQ/MB-5: Impact to Ocean Water Quality from Wedgewire Screen and Diffuser Operation and Maintenance	~~**SU**~~ **LTS**	**NI**	**LTS**	**SU**	~~**SU**~~ **LTS**
OWQ/MB-6: Impact to Special Status Species Populations of Intake Flow Reduction (Compared to 2010 Project) and Use and Maintenance of Wedgewire Screens	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
OWQ/MB-7: Impact to Special Status Species Populations of Diffuser Operation	~~**SU**~~ **LTS**	**NI**	~~**SU**~~ **LTS**	**LTS**	~~**SU**~~ **LTS** ↓
SECTION 4.2 AESTHETICS/LIGHT AND GLARE					
ALG-1: Visual Impacts from Offshore Construction Activities	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
ALG-2: Creation of New Sources of Substantial Light or Glare such as Nighttime Illumination	**LTSM**	**LTS**	**LTSM**	**LTSM**	**LTSM**

[4] Impact Class: SU = Significant and Unavoidable; LTSM = Less than Significant with Mitigation; LTS = Less than Significant; NI = No Impact

Table ES-4. Impact Summary: Lease Modification Project and Alternatives

Impact	Impact Class[4]				
		ALTERNATIVES			
	Lease Modification Project*	No Project (2010 Project)	Rotating Brush-Cleaned Stainless Steel Wedgewire Screen	Copper-Nickel Alloy**	Six-Port Diffuser *
SECTION 4.3 AIR QUALITY					
AQ-1: Air Emissions from Construction	**SU**	**SU**	**SU**	**SU**	**SU**
AQ-2: Creation of Objectionable Odors Affecting a Substantial Number of People	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
AQ-3: Consistency with Regional Air Quality Plan	**LTS**	**LTS**	**LTS** ↓	**LTS** ↓	**LTS**
CMLTV-AQ-1: Cumulative Air Emissions from Construction	**SU**	**SU**	**SU**	**SU**	**SU**
SECTION 4.4 CULTURAL RESOURCES					
CUL-1: Change in Significance of Previously Recorded Historical or Unique Archaeological Resources	**NI**	**NI**	**NI**	**NI**	**NI**
CUL-2: Change in Significance of Previously Unidentified Historical or Unique Archaeological Resources	**LTSM**	**NI**	**LTSM**	**LTSM**	**LTSM**
CUL-3: Construction or operation of the Lease Modification Project could damage or destroy paleontological resources	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
CUL-4: Disturb Unidentified Human Remains	**LTSM**	**NI**	**LTSM**	**LTSM**	**LTSM**
SECTION 4.5 CULTURAL RESOURCES—TRIBAL					
TCR-1: Change in Significance of Previously Recorded Tribal Cultural Resources	**NI**	**NI**	**NI**	**NI**	**NI**
TCR-2: Change in Significance of Previously Unidentified Tribal Cultural Resources	**LTSM**	**NI**	**LTSM**	**LTSM**	**LTSM**
SECTION 4.6 GREENHOUSE GAS EMISSIONS					
GHG-1: GHG Emissions from Project Activities	**LTS**	**LTS**	**LTS** ↑	**LTS** ↓	**LTS**
GHG-2: Consistency with Applicable GHG Plan, Policy, or Regulation	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
SECTION 4.7 HAZARDS AND HAZARDOUS MATERIALS					
HAZ-1: Construction and Operation Impacts of Routine Hazardous Material Transport, Use, or Disposal	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**

Table ES-4. Impact Summary: Lease Modification Project and Alternatives

Impact	Impact Class[4]				
		ALTERNATIVES			
	Lease Modification Project*	No Project (2010 Project)	Rotating Brush-Cleaned Stainless Steel Wedgewire Screen	Copper-Nickel Alloy**	Six-Port Diffuser *
HAZ-2: Release of Hazardous Materials through Reasonably Foreseeable Upset and Accident Conditions	**LTSM**	**LTS**	**LTSM**	**LTSM**	**LTSM**
SECTION 4.8 NOISE AND VIBRATION					
NOI-1. Construction and Operation Impacts in Excess of Applicable Community Noise Standards.	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
NOI-2: Vibration Impacts to Sensitive and Recreational Receptors	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
NOI-3: Construction Noise Impacts in Excess of Ambient Noise Levels	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
SECTION 4.9 RECREATION					
REC-1: Impacts to Recreation and Recreational Access from Lease Modification Project Activities.	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
SECTION 4.10 TRANSPORTATION (MARINE)					
TRM-1: Marine Vessel Safety	**LTSM**	**NI**	**LTSM**	**LTS**	**LTSM**

Notes:
* Includes stationary stainless steel wedgewire screen from the proposed Lease Modification Project as amended by the Applicant on June 26, 2017.
** Includes three duckbill nozzle diffuser with center port from the proposed Lease Modification Project
↑ Increased effect compared to other alternatives
↓Decreased effect compared to other alternative

1.0 INTRODUCTION

The California State Lands Commission (CSLC), in its continuing role as a responsible agency under the California Environmental Quality Act (CEQA; Pub. Resources Code, § 21000 et seq.), has prepared this Supplemental Environmental Impact Report (EIR) for the proposed *Seawater Desalination Project at Huntington Beach: Outfall/Intake Modifications & General Lease–Industrial Use (PRC 1980.1) Amendment* (or **Lease Modification Project**). The information herein supplements information in the September 2010 Final Subsequent EIR (2010 FSEIR) certified by the city of Huntington Beach (City), as CEQA lead agency. The 2010 FSEIR analyzed potential significant impacts associated with construction and operation of the 50 million gallon per day (MGD) Huntington Beach Desalination Plant (HB Desalination Plant or **2010 Project**).

In September 2010, the City approved the 2010 Project. In October 2010, the CSLC considered the certified 2010 FSEIR and amended General Lease–Industrial Use PRC 1980.1 for the portion of the 2010 Project within its jurisdiction. Other agencies–including the Santa Ana Regional Water Quality Control Board (RWQCB), California Coastal Commission (CCC), U.S. Army Corps of Engineers (potentially under a nation-wide permit), and local or regional water agencies such as the Orange County Water District (OCWD)–must also act before the HB Desalination Plant can be built, start operation, or distribute potable water. In July 2016, the owner, Poseidon Resources (Surfside) LLC (Poseidon or Applicant), submitted an application to the CSLC to modify structures and operations covered under the existing lease. The scope of analysis in this Supplemental EIR is limited to the area within PRC 1980.1 (see Figure 1-1).

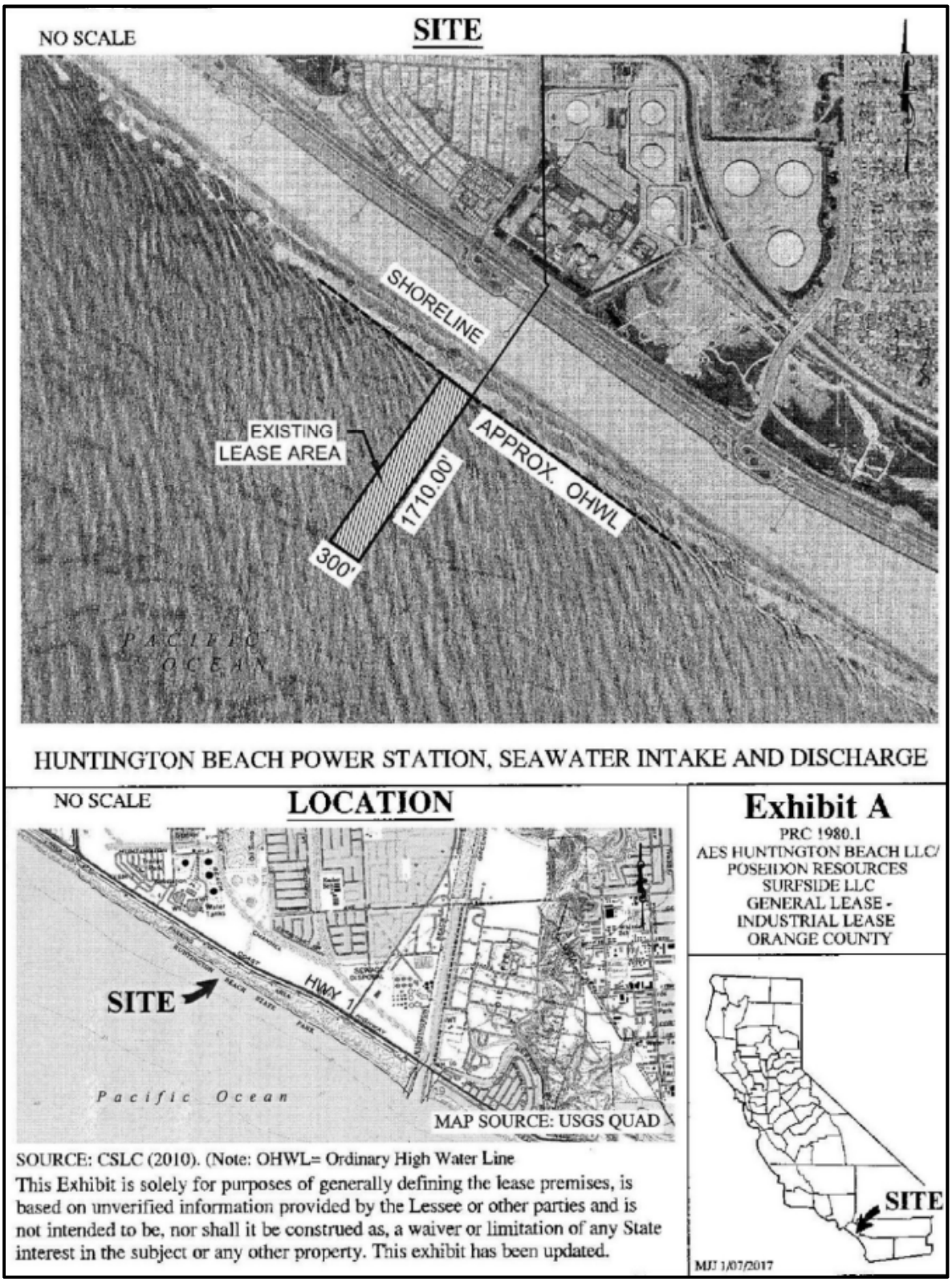
1.1 PROJECT LOCATION AND BACKGROUND

The HB Desalination Plant site evaluated in the 2010 FSEIR is located at 21730 Newland Street in Huntington Beach, Orange County, adjacent to the AES Huntington Beach Generating Station (HBGS). The 2010 Project included both onshore components—pretreatment facilities, reverse osmosis (RO) membranes, post-treatment facilities, product water storage, pump stations, chemical storage tanks, and electrical substation)—and two existing 14-foot-diameter pipelines that are components of the HBGS's Once-Through Cooling (OTC) system. The seawater intake pipeline extends offshore approximately 1,650 feet seaward of the Ordinary High Water Mark (OHWM), while the discharge pipeline (outfall) terminates 1,500 feet offshore.

PRC 1980.1 covers 11.78 acres of tide and submerged land offshore Huntington State Beach. Under PRC 1980.1, which has a 20-year lease term (through August 7, 2026):

- AES is responsible for obligations pertaining to use of the HBGS's intake and discharge pipelines for OTC (i.e., to continue to withdraw and discharge seawater used to cool the power plant's generators).

Figure 1-1. Lease Modification Project Location



Note: this Figure, which was Exhibit A for the CSLC's staff report in 2010 (Item 62, October 29, 2010), has been updated to correct the reference to the location of Beach Boulevard.

- Poseidon has a vested right to operate the portion of the HB Desalination Plant under the CSLC's jurisdiction, and is responsible for obligations pertaining to the 2010 Project's use of the pipelines.

The modifications proposed by Poseidon to amend PRC 1980.1 would occur offshore on State lands outside the City's jurisdiction (the City has no discretionary action over these modifications), and include the following operational changes and "technology enhancements" to, in part, comply with the provisions of the Desalination Amendment (see Table 2-2 in Section 2, *Project Description*):

- Reduce the volume of seawater withdrawn for desalination source water from 152 MGD (2010 Project volume) to 106.7 MGD
- Install wedgewire screens with 1-millimeter slots and a multiport diffuser on the offshore ends of the seawater intake and discharge pipelines (see Figure 1-2)

1.2 SUMMARY OF OTHER AGENCY ROLES

Appendix B, *Interagency Permit Sequencing Framework Agreement*, identifies the roles of the CSLC, RWQCB, and CCC in this current review. Figure 1-3 identifies several actions taken by these agencies since the City's 2010 Project approval. Poseidon states a screen and diffuser are required to operate the HB Desalination Plant seawater intake pump and to discharge brine and other RO effluent, and has proposed the Lease Modification Project to address anticipated RWQCB and CCC requirements for the facility, if built at the City-approved site. The roles of the RWQCB and CCC are summarized below and in Sections 1.2.2 and 1.2.3 below.

- The RWQCB, in consultation with the State Water Resources Control Board (SWRCB), must determine if the HB Desalination Plant complies with Water Code section 13142.5, subdivision (b), pursuant to the SWRCB-adopted amendment to the 2015 Water Quality Control Plan for the Ocean Waters of California (Ocean Plan) to address effects associated with the construction and operation of seawater desalination facilities (Desalination Amendment).[5] The RWQCB must also issue a National Pollutant Discharge Elimination System (NPDES) permit for facility discharges.
- The CCC must determine compliance with the California Coastal Act (Pub. Resources Code, § 30000, et seq.) and issue a coastal development permit (CDP) to Poseidon to build and operate the HB Desalination Plant. The CCC has

[5] Each RWQCB has discretionary authority to determine, on a project- and site-specific basis and in consultation with the SWRCB, compliance with Water Code section 13142.5, subdivision (b). This section provides in part: "[f]or each new or expanded coastal … industrial installation using seawater for cooling, heating, or industrial processing, the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life."

also accepted an appeal of a 2010 City-issued CDP and expects to consider the appeal and a new CDP application from Poseidon at an upcoming hearing.

Figure 1-2. Lease Modification Project Wedgewire Screens and Diffuser

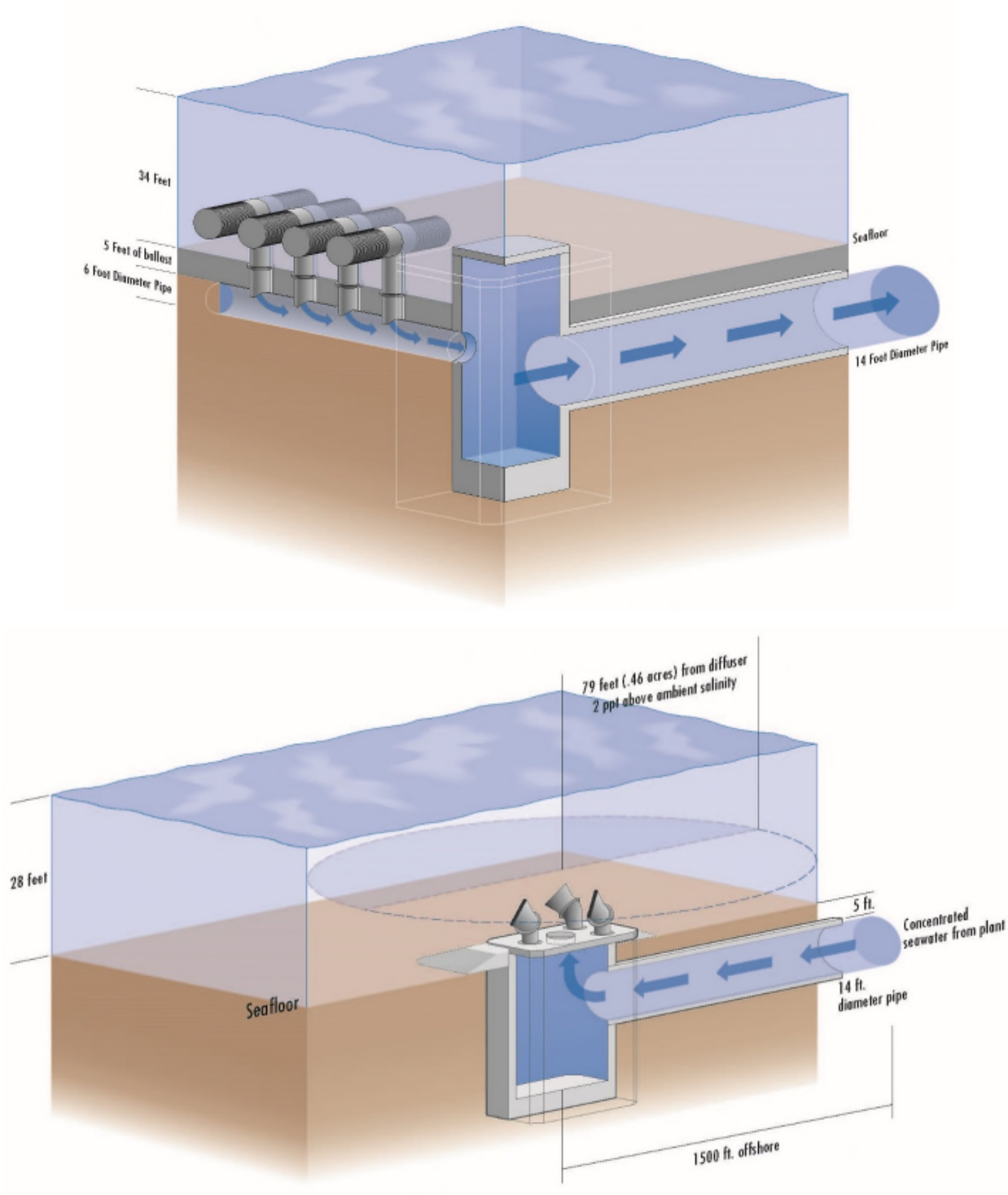
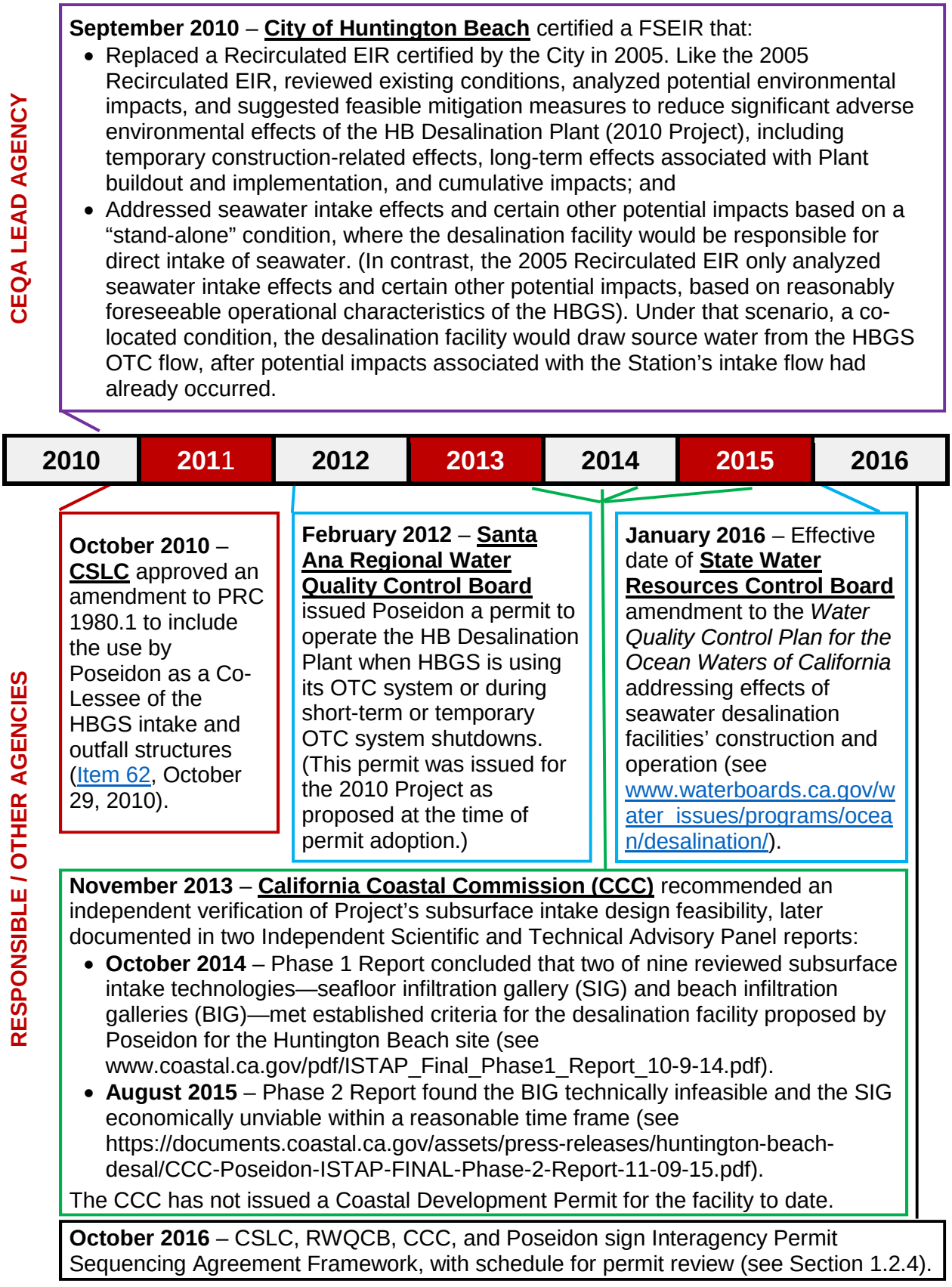


Figure 1-3. Timeline of HB Desalination Plant Actions (2010-2016)



1.2.1 Project Context with Respect to Once-Through Cooling

In 2010, the SWRCB adopted a Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (OTC Policy)[6] that established technology-based standards to reduce harmful effects, including entrainment and impingement, on marine and estuarine life from power plant cooling water intake structures.[7] Since commencing operation in 1958, operators of the HBGS, including AES, have used OTC using seawater to cool steam produced by the power plant (California Energy Commission 2014a). AES currently maintains an entrainment and impingement mitigation program. AES also plans to cease using seawater for OTC by or before December 31, 2020, in compliance with the SWRCB OTC Policy. (The SWRCB could modify this date if power from the Station's generating units is required for local electricity reliability.)

Poseidon's proposed schedule for the Lease Modification Project (see Table 2-4 in Section 2, *Project Description*), has Poseidon installing the multiport diffuser as early as late 2019 (before the HBGS is decommissioned, during a time when the power plant is temporarily shut down, which often occurs during winter months when electricity demand is lower). Installation of the wedgewire screens would also occur before HB Desalination Plant operation. A reduction in intake volume and use of wedgewire screens would reduce impingement effects now occurring at the facility. Stand-alone desalination operation would also avoid or reduce thermal plumes (caused by releases of cooling water at temperatures above ambient conditions) associated with current OTC operations but would affect discharge salinity and velocity near the outfall diffuser.

1.2.2 Santa Ana RWQCB Permitting Status

In February 2012, the RWQCB adopted Order No. R8-2012-0007, NPDES No. CA8000403 (2012 Order), thereby renewing for a 5-year term the NPDES Permit issued in 2006 in accordance with the provisions contained therein, including:[8]

- Allowed the Discharger to use the HBGS intake pumps in a temporary stand-alone mode when power plant operations do not provide sufficient flows (i.e., approximately 126.7 MGD)
- Established maximum daily discharge flow limits to allow for the temporary maximum operation of all proposed RO units and to account for initial start-up operations and temporary on-site maintenance (approximately 126.7 MGD)

[6] www.swrcb.ca.gov/water_issues/programs/ocean/cwa316/. The Policy was effective on October 1, 2010.

[7] Entrainment is the intake of smaller marine organisms into and through the OTC system where mechanical systems, temperature increases, or toxic stress destroy most or all of the organisms. Impingement occurs when marine organisms are trapped against screens or other OTC system components, where they die.

[8] www.waterboards.ca.gov/santaana/board_decisions/adopted_orders/orders/2012/12_007_Poseidon_Resources_Surfside_Huntington_Beach_Reneal_of_WDR.pdf (2012 NPDES permit).

- Authorized the discharge of "RO effluent, filter backwash, RO subsequent rinse wastewater, [and] stormwater runoff" to the ocean under co-located and temporary stand-alone operating conditions[9]

The 2012 Order included the following Findings.

- *When operating in conjunction with the power plant (co-located scenario), the Facility will not increase the volume or the velocity of [the plant's] cooling water intake, nor will it increase the number of organisms impinged and/or entrained by the [plant's] cooling water intake structure. Therefore, when the Facility is operating in co-located mode, there will be no additional impacts on marine life (page 8).*
- *When the Facility is operating in temporary stand-alone mode it is utilizing the best available site, design, technology and mitigation measures feasible to minimize the intake and mortality of all forms of marine life and is in compliance with [California Water Code section 13142.5, subdivision (b]) (page 9).*

In 2015, the SWRCB adopted the Desalination Amendment. Among other requirements, the SWRCB added considerations for intake and brine discharge technology, including:

- **Chapter III.M.2.d(1)(c)**. If subsurface intakes are not feasible, the regional water board may approve a surface water intake, subject to the following conditions:
  - i. The [RWQCB] shall require that surface water intakes be screened. Screens must be functional while the facility is withdrawing seawater.
  - ii. In order to reduce entrainment, all surface water intakes must be screened with a 1.0 [millimeter] (0.04 [inch]) or smaller slot size screen when the desalination facility is withdrawing seawater….
  - iv. In order to minimize impingement, through-screen velocity at the surface water intake shall not exceed 0.15 meters per second (0.5 feet per second).
- **Chapter III.M.2.d(2)(a)**. The preferred technology for minimizing intake and mortality of all forms of marine life resulting from brine discharge is to commingle brine with wastewater (e.g., agricultural, municipal, industrial, power plant cooling water, etc.) that would otherwise be discharged to the ocean….
- **Chapter III.M.2.d(2)(b)**. Multiport diffusers are the next best method for disposing of brine when the brine cannot be diluted by wastewater and when there are no live organisms in the discharge. Multiport diffusers shall be engineered to maximize dilution, minimize the size of the brine mixing zone, minimize the suspension of benthic sediments, and minimize mortality of all forms of marine life.

[9] The 2010 Project and PRC 1980.1 also authorized both co-located operation (where desalination source water is taken entirely from the HBGS's wastewater effluent stream) and stand-alone operation after HBGS OTC ends (where source water is withdrawn directly through the intake pipeline, and brine and other permitted effluent are discharged through the outfall absent blending with OTC discharge).

In June 2016, Poseidon applied to the RWQCB for a renewed and amended NPDES permit and requested a determination of Water Code section 13142.5 compliance. In July 2016, RWQCB staff subsequently notified Poseidon of the following:

> *The 2012 Order is set to expire on February 1, 2017. Due to Poseidon's material modifications to the proposed Project and State Water Resources Control Board's (State Water Board's) adoption of new requirements for desalination facilities described below, the 2012 Order is no longer valid for the Project as currently proposed…. The proposed Project is a "new" desalination facility. (Ocean Plan, Chapter III.M.1.b(3).) Therefore, it is necessary for Poseidon to submit the information required by the Desalination Amendment, and for the Regional Water Board to conduct a new Water Code section 13142.5(b) analysis for the Project in accordance with the requirements of the Desalination Amendment.* (Letter from Kurt Berchtold, Santa Ana RWQCB, to Scott Maloni, Poseidon, July 29, 2016.)

The RWQCB is currently conducting the Water Code section 13142.5, subdivision (b) analysis in accordance with the Desalination Amendment, the results of which could result in a change to Poseidon's site, design, technology, or mitigation measures needed to conform to the Desalination Amendment. Although Poseidon has not applied for any alternative site, the RWQCB, in coordination with the SWRCB and CCC, is reviewing alternative sites to the 2010 Project as part of its regulatory process.

On May 23, 2017, the RWQCB identified remaining outstanding information needs associated with Poseidon's application, including the following information required for "Alternative Sites for Further Analysis" (see Figure 1-4). (Letter from Hope Smythe for Kurt Berchtold, Santa Ana RWQCB, to Scott Maloni, Poseidon, May 23, 2017.)

Segment 1 • Property 1 A - D, Sunset Gap • Segment 1: Property 1 H	Further analysis of surface and subsurface intakes and other analyses are still needed
Segment 1 • Property 1 E - F, Bolsa Gap	Further analysis of surface intakes at this site is not required due to potential impacts to Bolsa Chica Basin and Bolsa Bay State Marine Conservation Areas Further analysis of subsurface intakes and other analyses are still needed
Segment 2	Further analysis for subsurface intakes is not required Further analysis of surface intakes and other analyses are still needed

Note: see Figure 1-4 below for a map showing the location of the identified segments and properties.

~~At such time as the RWQCB completes its Water Code section 13142.5, subdivision (b) determination, if~~If the RWQCB identifies a site outside the PRC 1980.1 lease boundaries at the conclusion of its Water Code section 13142.5, subdivision (b) analysis, new CEQA or CEQA functional equivalent analysis would need to be conducted~~ pursuant to such action~~ for any project proposed at that site to analyze potential significant impacts of that specific proposed project on the environment.

Figure 1-4. Alternative Sites for Further Analysis (Evaluated pursuant to Wat. Code, § 13142.5, subd. (b) [2017])

1.2.3 CCC Permitting Status

Poseidon must also obtain a CDP from the CCC to build and operate the HB Desalination Plant, since previous CDPs authorized by the City, pursuant to the City's certified Local Coastal Program (LCP), were appealed to the CCC and Poseidon withdrew its application relating to the CCC's retained jurisdiction as described below.[10] Previous CDP applications through 2016 are summarized below.

- In 2006, the City approved a CDP for the portions of the HB Desalination Plant in the City's LCP jurisdiction. Upon appeal, the CCC found that substantial issue existed with respect to Poseidon's conformity to LCP policies related to protection of marine life and water quality, protection of environmentally sensitive habitat areas, energy use and development, and adequate public services.
- In September 2010, the City issued a new CDP that was appealed. In November 2010, the CCC found substantial issue existed with the same LCP issue areas as in the 2006 appeal and additional LCP policies (wetlands protection, the facility's land use designation, public recreation, protection against seismic events and liquefaction, growth-inducement, and mitigation to the maximum extent feasible).
- At a November 2013 hearing, CCC staff recommended conditional approval of a CDP, requiring Poseidon to build a subsurface seawater intake system, unless additional information was provided showing the infeasibility of subsurface intakes. Poseidon withdrew its application, and several Coastal Commissioners recommended that Poseidon and CCC staff independently determine the feasibility of alternative subsurface seawater intake technologies at the site.
- In September 2015, Poseidon submitted a new CDP Application, No. 9-15-1731, for co-located and stand-alone operation scenarios at the Huntington Beach site.
- In November 2015, an Independent Scientific Technical Advisory Panel (ISTAP), jointly convened by CCC staff and Poseidon after the 2013 CCC meeting, submitted its conclusions following a two-phase review on the feasibility of subsurface intake systems at the site.[11]

[10] See https://documents.coastal.ca.gov/reports/2017/1/f7a-1-2017.pdf for a history of CCC actions.

[11] The ISTAP (2015) Phase 2 Report concluded (pages 16-19):

1) A Beach Infiltration Gallery (BIG) is technically infeasible at the Huntington Beach location.
2) Two construction methods (trestle and "float-in") are feasible for constructing a Seafloor Infiltration Gallery (SIG).
3) The environmental impacts of the SIG options would not likely prohibit their implementation.
4) The open ocean intake option for a product capacity of 50 MGD may be economically feasible in the near future, depending on outcome of negotiations with OCWD.
5) The higher unit costs for the SIG options significantly extend the period of time before the unit cost could be comparable to costs of other available water supplies.
6) The SIG option is not economically viable at the Huntington Beach location within a reasonable time frame, due to high capital costs and only modest reduction in annual operating costs compared to the open ocean intake option.

- In October 2016, Poseidon withdrew its 2015 CDP application No. 9-15-1731 after the CSLC, Santa Ana RWQCB, and CCC staffs and Poseidon signed an Interagency Permit Sequencing Framework Agreement (2016 Agreement; see Appendix B) for permit review, which identified a schedule for agency approvals.

1.2.4 Interagency Permit Sequencing Framework Agreement

The schedule established in the 2016 Agreement is summarized below.

- The CSLC will complete its CEQA review of the application submitted by Poseidon to amend the October 2010 amendment of Lease No. PRC 1980.1.
- The RWQCB will make available for public review its tentative order amending and/or renewing the 2012 NPDES Permit and tentative Water Code section 13142.5, subdivision (b) compliance determination within 90 days of: (a) a RWQCB determination that complete applications have been submitted for the NPDES Permit and the compliance determination; (b) a final approval by the CSLC on Poseidon's application to modify PRC 1980.1; and (c) approval and/or certification of any and all CEQA documents and related environmental information and analysis necessary for the RWQCB to act as a CEQA responsible agency in connection with Poseidon's Project.
- The CCC staff will schedule a hearing on Poseidon's CDP application either (whichever is earlier): (a) 90 days from the Santa Ana RWQCB's public release of the Tentative Order amending and renewing Order No. R8-2012-0007/NPDES No. CA8000403 and its Water Code section 13142.5, subdivision (b) compliance determination; or (b) the first Southern California CCC hearing following the Tentative Order public release (if there are at least 21 days between the date of the RWQCB's staff's action and the "first mailing" date for that CCC meeting).

1.2.5 City of Huntington Beach and Orange County Water District

In its 2010 FSEIR, the City analyzed the distribution of desalinated water, including various options and volumes, into the local and regional potable water system. In 2015, the OCWD Board approved a non-binding agreement (term sheet) with terms and conditions by which OCWD and Poseidon could negotiate contracts for the purchase of desalinated water (up to 56,000 acre feet per year consistent with distribution volumes in the 2010 FSEIR) (OCWD 2015b). After initially proposing to prepare an EIR for a potable water distribution or storage system, the OCWD stated that it would not finalize its water purchase agreement with Poseidon until after the HB Desalination Plant receives all required state approvals:

> *Given the expected timeline for the [HB Desalination Plant's] permitting process, OCWD has also concluded that it would not be prudent to begin an extensive environmental analysis related to use of the desalinated water in OCWD's operations and facilities, along with distributing the water to other agencies, prior to the approval*

of the permits for the [Huntington Beach Desalination Plant]. Decisions by the Regional Board and the other permitting agencies may result in new or different information that could increase the cost of the desalinated water and/or modify OCWD's plans for using and distributing the water. (Letter from Michael R. Markus, OCWD General Manager, to Kurt Berchtold, Santa Ana RWQCB, March 20, 2017.)

Based on this information, potential modifications contemplated to distribute desalinated water by local or regional water agencies is speculative at this time and not germane to the Lease Modification Project. Future CEQA analysis may be needed to construct an onshore desalinated drinking water distribution system, for example if a proposed system differs from the distribution system previously evaluated in the 2010 FSEIR.

1.3 OVERVIEW OF ENVIRONMENTAL REVIEW PROCESS

This section describes the basic CEQA requirements for project review and explains the rationale for preparing a Supplemental EIR to evaluate the proposed Lease Modification Project. Previous CEQA analyses for the HB Desalination Plant are described, along with the regulatory actions that led to Poseidon's request to modify PRC 1980.1.

1.3.1 Project Context with Respect to CEQA

With certain limited exceptions, CEQA requires State and local agencies to consider the environmental consequences of projects over which they have discretionary authority before taking any action to approve those projects. It establishes both procedural and substantive requirements that agencies must satisfy to meet CEQA's objectives. The basic purposes of CEQA are to (State CEQA Guidelines, § 15002, subd. (a)):

(1) Inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities.

(2) Identify ways that environmental damage can be avoided or significantly reduced.

(3) Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.

(4) Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The preparation of an informational document that assesses potential environmental effects of a project and identifies mitigation measures and alternatives to reduce or avoid significant impacts can achieve this purpose. Other key requirements can include: (1) early agency and public consultation; (2) specific noticing and distribution actions to maximize public involvement in the environmental review process; and (3) development of a plan to implement and monitor mitigation measures

This Supplemental EIR has been prepared in accordance with the California Supreme Court's decision in December 2015 in *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal. 4th 369, 386. In that case, the Court held that "CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents." With limited exceptions, the Court concluded that the impacts of existing environmental hazards only need to be analyzed if a proposed project risks exacerbating those hazards or conditions. Therefore, this Supplemental EIR does not identify earthquakes, tsunamis, or other existing hazards as impacts of the Lease Modification Project.

CEQA section 21002 states in part that it is the policy of the state that public agencies:

> *should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required by this division are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects.*

The State CEQA Guidelines (§ 15121, subd. (b)) further requires public agencies to prepare written findings of fact for each significant environmental impact identified in the EIR upon certification and before project approval. Possible findings are (State CEQA Guidelines, § 15091, subd. (a)):

(1) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

(2) Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

(3) Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

Under CEQA, if the above considerations make identified mitigation measures or alternatives infeasible and thus implementation of a project would result in the occurrence of one or more significant effects, the agency can only approve the project if it prepares a written statement that the project's environmental benefits (economic, legal, social, technological, or other region- or statewide benefits) outweigh the unavoidable adverse environmental effects. This statement of "overriding considerations" must be supported by specific reasons and evidence in the record for making such a determination.

1.3.2 Previous CEQA Documents Prepared for the Poseidon Project

As shown in Figure 1-2, the City, as CEQA lead agency, took the first discretionary action on the HB Desalination Plant. The City prepared a **2003 EIR** that analyzed construction and operation impacts but it was not certified due to lack of sufficient information on marine biology (entrainment and impingement), growth inducement, and project water compatibility. The City subsequently certified a **2005 Recirculated EIR** and approved the HB Desalination Plant under the following co-located operations:

- Withdrawal, as source water for the desalination process, a portion of the existing discharge flow associated with the HBGS, which had already been withdrawn from the ocean via the existing intake pipeline
- Desalination of seawater using RO technology,[12] producing 50 MGD of potable water to be delivered through a system of onshore distribution pipelines
- Discharge of a commingled effluent comprised of up to 75 MGD of RO byproduct (concentrate seawater [brine], filter backwash, and subsequent rinse wastewater) and remaining OTC seawater flow to the ocean via the existing outfall

After 2005, AES began evaluating options to cease OTC at the HBGS. After Poseidon submitted a modified application to the City, the City evaluated co-located and stand-alone operations and onshore facility and distribution pipeline revisions in its 2010 FSEIR. As part of its September 2010 approval, the City made findings and adopted a Mitigation Monitoring and Reporting Program and a statement of overriding considerations. In October 2010, the CSLC, as a responsible agency relying on the 2010 FSEIR, also made findings, adopted mitigation measures and a statement of overriding considerations, and approved an amendment to PRC 1980.1.

1.3.3 Public Scoping (2016)

On November 18, 2016, the CSLC issued a Notice of Preparation (NOP) of a Draft Supplemental EIR for the proposed Lease Modification Project to responsible and trustee agencies and other interested parties (pursuant to Pub. Resources Code, § 21080.4 and State CEQA Guidelines, § 15082, subd. (a)). Through the NOP, the CSLC solicited comments on the Supplemental EIR's scope during a 30-day comment period and at a scoping meeting held in the city of Huntington Beach on December 14, 2016. Table 1-1 lists commenters on the NOP (see Appendix D for meeting transcripts and an index to where scoping comments are addressed in this Supplemental EIR).

[12] In the RO process, seawater is pretreated to remove particles then pumped at high pressure through permeable membranes to separate the salts from the water. The quality of the water produced depends on the pressure, the concentration of salts in the water, and the salt permeation constant of the membranes. For this facility, Poseidon estimated that the brine concentration would be about 63.1 parts per thousand (ppt). (Background ocean water salinity at the Lease Modification Project site is about 33.5 ppt.)

Table 1-1. NOP Commenters

Written Comments	Local/Regional Agency	• City of Huntington Beach Environmental Board • Orange County Public Works • Southern California Association of Governments • South Coast Air Quality Management Board
	State Agency	• California Coastal Commission • California Department of Parks and Recreation • Native American Heritage Commission • Santa Ana Regional Water Quality Control Board
	Non-Governmental Organizations (NGOs) (* = combined letter)	• California Coastal Protection Network * • California Coastkeeper Alliance * • Desal Response Group * • Friends of Harbors, Beaches and Parks • Heal the Bay * • Natural Resources Defense Council * • Orange County Coastkeeper * • Residents for Responsible Desalination * • Southern California Watershed Alliance * • Surfrider Foundation * • Surfrider Foundation, Huntington Beach Seal Beach Chapter *
	Businesses and Individuals	• Richard Armendariz • Ken Asbury • Kim and AJ Aschenbrenner • Dennis Ashendorf • Mary Jo Baretich • Nolan Bautista • Jeanine and Joel Benson • Pam Brennan • Linda Conn • Shirley Dettloff • Marinka Horack • Joshua McIntosh • Ross Nash • Kirk and Mary Nason • Patrick O'Sullivan • Bruce and Cheryl Pulcini • Ann Tarkington • Steve Tyler • Dallas Weaver • Jay Schneider • Tim Noble • Kathy Abler • Penny Elia • Bill McCarty • Jason Pyle • Merle Moshiri
Scoping Meeting Speakers	Agencies	• City of Huntington Beach Environmental Board • City of Huntington Beach Planning Commission
	NGOs	• California Coastal Protection Network • Friends of Harbors, Beaches, and Parks • Orange County Coastkeeper • Residents for Responsible Desalination • Surfrider Foundation
	Businesses and Individuals	• F. Adelman • Armida Brashears • Susanne Dehritz • Clay Dominguez • Conner Everts • Richard Fancher • P. Kabre • L. Marcovici • Scott Smith • Bruce Wareh • Dallas Weaver

1.3.4 Draft Supplemental EIR (2017)

On May 26, 2017. the Commission issued a Notice of Availability/Public Hearing of a Draft Supplemental EIR and released the Draft Supplemental EIR for at least a 45-day public review. On June 12, 2017. Commission staff held a noticed public meeting on the Draft Supplemental EIR at 5:00 p.m. in the City of Huntington Beach. At this meeting, the public and interested agencies had the opportunity to comment on the Draft Supplemental EIR. On June 27, 2017. Commission staff extended the public review period an additional 2 weeks to July 27, 2017 (approximately 60 days total). From July through September 2017, Commission staff obtained additional information as needed to respond to comments, responded to all comments received and revised the Draft Supplemental EIR as summarized in Part I, Section I.6, *Summary of Major Changes To Draft Supplemental EIR*, in this Supplemental EIR.

Part II of this Final Supplemental EIR contains copies of comment letters and emails received on the Draft Supplemental EIR, excerpts of oral comments from the transcripts of the public meeting on the Draft Supplemental EIR held by Commission staff on June 12, 2017, and the Commission's responses. The following comments on the Draft Supplemental EIR were received (see Table II-1).

- Total comment letters submitted by letter or email: **75** elected officials (9); agencies (9); organizations (32) (several organizations submitted joint letters); public (23); and applicant (2)
- Speakers who provided oral comments at June 12, 2017, public meeting: **11**
- Approximately **1,400** comments from letter-writing campaigns in support of or opposed to the Lease Modification Project or desalination in Huntington Beach.

1.3.5 EIR Repository Sites and Information Sources

Placing CEQA documents in "repository sites" can be an effective way to provide information about a project. This EIR is available at two repository sites in the Proposed Project vicinity and at CSLC offices in Long Beach and Sacramento (see Table 1-2).

Table 1-2. Supplemental EIR Repository Locations

Libraries:	Huntington Beach Central Library 7111 Talbert Ave. Huntington Beach, CA 92648 (714) 842-4481	Main Street Branch Library 525 Main St. Huntington Beach, CA 92648 (714) 375-5071
CSLC Offices:	California State Lands Commission Attn: Mark LeClair 200 Oceangate, 12th Floor Long Beach, CA 90802 (562) 590-5266	California State Lands Commission Attn: Alexandra Borack 100 Howe Ave., Suite 100-South Sacramento, CA 95825 (916) 574-1310

1.4 PURPOSE AND SCOPE OF SUPPLEMENTAL EIR

The purpose of this Supplemental EIR is to identify the potential significant impacts on the environment from the Lease Modification Project, to identify alternatives that would reduce the significant effects of this project, and to indicate the manner in which those significant effects could be mitigated or avoided (Pub. Resources Code, § 21002.1, subd. (a)). This Supplemental EIR is intended to provide the CSLC with information required to exercise its jurisdictional responsibilities with respect to the Lease Modification Project (to be considered at a noticed public hearing. Responsible agencies use the information in a certified EIR in exercising their respective jurisdictional or regulatory responsibilities. The scope of this Supplemental EIR is limited to evaluating the changes to the 2010 lease and the incremental effects of those modifications~~)~~, and should be read in conjunction with the 2010 FSEIR. The onshore facilities (which the City approved in 2010) are not included in this analysis.

A fundamental consideration in identifying potential significant impacts is establishing the appropriate baseline for the Supplemental EIR analysis. Impacts are identified by comparing changes to the environment caused by Poseidon's proposed Lease Modification Project activities with the environmental conditions associated with the offshore portions of the intake and discharge facilities analyzed in the 2010 FSEIR. Use of an appropriate baseline is also important for establishing alternatives to the proposed activities that can be analyzed in the Supplemental EIR. The alternatives need to be capable of reducing or avoiding one or more significant impacts of the Lease Modification Project, but do not need to address impacts associated with baseline conditions. The CSLC must identify which components of a project are known or reasonably foreseeable; if it finds that a particular impact is too speculative for evaluation, the CSLC should note its conclusion and terminate discussion of the impact (State CEQA Guidelines, § 15145).

1.4.1 CSLC 2010 Approval and Rationale for Supplemental EIR

In October 2010, the CSLC, as a responsible agency, considered the certified 2010 FSEIR and approved the amendment to PRC 1980.1 adding Poseidon as a Co-Lessee and authorizing Poseidon to use the existing seawater intake and discharge pipelines for desalination without physical modification. In July 2016, the CSLC received an application from Poseidon for the Lease Modification Project. Given Poseidon's vested right under the executed lease, the CSLC is evaluating the incremental effects associated with the proposed Lease Modification Project when evaluating whether such modifications to the approved 2010 Project would result in any significant environmental impacts. (*Benton v. Board of Supervisors* (1991) 226 Cal.App.3d 1467, 1482; *Temecula Band of Luiseno Mission Indians v. Rancho Cal. Water Dist.,* 43 Cal.App.4th 425, 437.)

Under the State CEQA Guidelines (§ 15162, subd. (a)(1)), when an EIR has been certified or negative declaration adopted for a project, no subsequent or supplemental

EIR shall be prepared for that project unless several conditions exist on the basis of substantial evidence in the light of the whole record, including:

> *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….*

The CSLC, in its continuing role as responsible agency and consistent with State CEQA Guidelines section 15163, has made the following determinations.

- The proposed Lease Modification Project may involve new significant environmental effects or a substantial increase in the severity of previously identified significant impacts.
- The 2010 FSEIR, which was the subject of several levels of environmental review through 2010, retains "relevance" in light of the proposed modifications to PRC 1980.1 and continues to have "informational value" consistent with the California Supreme Court's ruling in *Friends of the College of San Mateo Gardens v. San Mateo Community College District* (2016) 1 Cal. 5th 937.
- Only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed circumstances.

The CSLC, therefore, is preparing this Supplemental EIR to evaluate the potential significant impacts associated with the Lease Modification Project. Considerations associated with this determination are identified in Table 1-3.

This Supplemental EIR incorporates previously published information by referencing relevant portions of the City's CEQA documents (e.g., the 2010 FSEIR) and the SWRCB (2015a) SED discussed above. This approach is intended to facilitate understanding of the Lease Modification Project and its impacts, and to eliminate the need for frequent reader referral to the prior CEQA documents that evaluated the 2010 Project. Consistent with CEQA requirements, the CSLC has engaged in a good faith, reasonable effort towards full public disclosure of the potential effects of the proposed Lease Modification Project, and it is not the purpose of this Supplemental EIR to recommend either approval or denial of a project. Prior to a decision on whether or not to modify PRC 1980.1, the CSLC must certify that (State CEQA Guidelines, § 15090):

- The Supplemental EIR has been completed in compliance with CEQA.
- The Supplemental EIR was presented to the CSLC in a public hearing and the CSLC reviewed and considered the information contained in the Final Supplemental EIR prior to taking action on the Lease Modification Project.
- The Supplemental EIR reflects the CSLC's independent judgment and analysis.

Table 1-3. Considerations Relevant to Supplemental EIR Scope

- The CSLC granted the Applicant a vested right in the form of an executed lease for a 20-year lease term (through August 7, 2026), associated with portion of the HB Desalination Plant offshore the City-approved site (PRC 1980.1). Given Poseidon's executed lease and the lack of CSLC jurisdiction onshore (above the OHWM), the Lease Modification Project is distinct from any proposed onshore modifications within the jurisdictions of the City or applicable local or regional water agencies (including to the approved 2010 Project).[13]
- Construction activities required to install screens and a diffuser on the HBGS pipelines would generate impacts similar to those of related offshore projects, such as adding marine organism barriers to the San Onofre Generating Station (SONGS) intake pipelines (see SONGS Units 2 and 3 Offshore Large Organism Exclusion Device Installation Project, Mitigated Negative Declaration, October 2012).*
- Operational impacts associated with wedgewire screens and diffusers are: (1) generally evaluated in the SWRCB (2015a) *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes* (SED) ** as part of the Desalination Amendment; and (2) analyzed in comparison to those impacts considered in the 2010 FSEIR.

Notes:
* www.slc.ca.gov/Info/CEQA/SONGS_LOED.html
** www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/rs2015_0033_sr_apx.pdf

1.4.2 Baseline and Future Conditions

Baseline conditions for this Supplemental EIR are defined (consistent with State CEQA Guidelines, § 15125, subd. (a)), as the existing physical environmental conditions in the vicinity of PRC 1980.1 that may be affected by the Lease Modification Project. This setting constitutes the baseline physical conditions by which the CSLC will determine whether or not impacts from the Lease Modification Project and alternatives are significant. Project impacts are defined as changes to the environmental setting that are attributable to project components or operations.

Potential impacts are often analyzed in the context of the local and regional physical environmental conditions existing at the time the NOP of environmental documentation was released (in this case, November 2016). In some circumstances, future conditions may be used for the environmental setting, such as conditions that will exist when a project begins operations. (*Neighbors for Smart Rail v. Exposition Metro Line Constr.*

[13] In contrast, the RWQCB considers the HB Desalination Plant a "new" facility (see Section 1.2.2, *Santa Ana RWQCB Permitting Status*). Similarly, the CCC staff refers to "significant project changes, changed circumstances, and new information" since the 2010 CEQA review (letter from Tom Luster, CCC, to Cy Oggins, CSLC, December 21, 2016).

Auth. (2013) 57 Cal.4th 439.) Baseline conditions for the proposed PRC 1980.1 Lease Amendment include the following assumptions:

- Relevant baseline information from the 2010 FSEIR has been used, if it has been verified to be still accurate and relevant.
- Baseline information is provided based on the NOP date (November 2016) for environmental disciplines in the 2010 FSEIR that did not cover offshore impacts.

1.4.3 Potential Impacts and Summary of Alternatives Evaluated

Consistent with State CEQA Guidelines section 15163, subdivision (b), this supplement to the 2010 FSEIR contains "only the information necessary to make the previous EIR adequate for the project as revised." Consequently, this Supplemental EIR identifies potential significant impacts of the proposed Lease Modification Project on the environment and indicates if and how the impacts can be avoided or reduced by mitigation measures or alternatives. As described in Section 4.0, *Environmental Setting and Impact Analysis*, the following impact areas would not be impacted by the Lease Modification Project, and are therefore eliminated from consideration in this Supplemental EIR:

- Agricultural and Forestry Resources
- Biological Resources (Terrestrial)
- Hydrology, Drainage, and Storm Water Runoff
- Geology and Soils
- Land Use and Planning
- Mineral Resources
- Population and Housing
- Public Services
- Transportation/Traffic (onshore)
- Utilities and Service Systems

The following sections provide information on potentially significant environmental effects associated with construction or operation of the Lease Modification Project:

- Ocean Water Quality and Marine Biological Resources
- Aesthetics/Light and Glare
- Air Quality
- Cultural Resources
- Cultural Resources – Tribal
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Noise
- Recreation
- Transportation (Marine)

Pursuant to State CEQA Guidelines section 15126.6, an EIR must describe and evaluate a range of reasonable alternatives that would feasibly attain most of the project's basic objectives, and would avoid or substantially lessen any of the significant impacts of the project as proposed. The State CEQA Guidelines also state that the range of alternatives required to be evaluated in an EIR is governed by the "rule of reason" (§ 15126.6, subd. (f))—that is, an EIR needs to describe and evaluate only those alternatives necessary to permit a reasoned choice and to foster informed decision making and public participation. The State CEQA Guidelines also require that

the EIR evaluate a "no project" alternative and, under specific circumstances, designate an environmentally superior alternative from among the remaining alternatives.

Possible alternatives not already evaluated in the City's 2010 FSEIR include different intake screen sizing and different diffuser types and configurations. Alternatives to the HB Desalination Plant's site location or intake and discharge pipeline locations would be encompassed in the no project alternative, as the action before the CSLC is either to approve or disapprove Poseidon's proposed amendment to existing PRC 1980.1. Alternatives to the proposed Lease Modification Project are analyzed in Section 5, *Alternatives*, or are screened from further consideration if the alternative is infeasible or has no greater environmental benefits over the proposed Lease Modification Project.

1.4.4 Cumulative Impacts Analysis

An EIR must discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (State CEQA Guidelines, § 15130). A cumulative impact is an impact that is created through a combination of the project being analyzed in the EIR and other projects in the area causing related impacts. Section 3, *Cumulative Projects*, defines the applicable geographic scope of the cumulative analysis ("Cumulative Projects Study Area"), and lists future planned and approved projects to be included in the cumulative environment.

1.5 AGENCY USE OF SUPPLEMENTAL EIR / ANTICIPATED APPROVALS

The information provided in this Supplemental EIR, if certified, will assist the CSLC in making its decision to approve, conditionally approve, or deny the Lease Modification Project. Each additional responsible agency is responsible for considering the effects of those activities that it is required by law to carry out or approve (Pub. Resources Code, § 21002.1, subd. (d)). Section 3.8 of the 2010 FSEIR presented a list of agency approvals, including those to be issued by agencies acting as responsible agencies under CEQA. Most of those agency actions are related to construction and operation of the HB Desalination Plant. Table 1-4 lists potential additional agreements, permits and approvals related to the Lease Modification Project.

Table 1-4. Other Potential Lease Modification Project Approvals

Agency	Permit, Approval, or Consultation	Covered Activity
Local/Regional		
South Coast Air Quality Management District	Permit to Construct	Offshore emissions
State		
California Coastal Commission	Coastal development permit; federal consistency review	Construction and operation in coastal zone

Agency	Permit, Approval, or Consultation	Covered Activity
California Department of Parks and Recreation	Waiver of Grant of Easement (co-located operations); Grant of Easement (stand-alone operation)	Those portions of the intake and discharge pipelines that cross beneath Huntington State Beach
Santa Ana Regional Water Quality Control Board	National Pollutant Discharge Elimination System Permit/ Waste Discharge Requirements	Discharge into ocean consistent with Ocean Plan; consistency with Water Code section 13142.5, subdivision (b)
Federal		
U.S. Army Corps of Engineers	Section 10 and 404 permits	Offshore construction
U.S. Coast Guard	Notice to Mariners	Offshore construction and maintenance requiring marine vessels
U.S. Fish and Wildlife Service and National Marine Fisheries Service	Protection of federally listed marine resources, implementation of Marine Mammal Protection Act and Magnuson-Stevens Fishery Conservation and Management Act, Conservation, protection, and enhancement of fish, wildlife, plants, and their habitats	

1.6 ORGANIZATION OF SUPPLEMENTAL EIR

The Supplemental EIR is presented in nine sections as shown below:

- **Section 1 – Introduction** provides background on the Lease Modification Project and the CEQA process.
- **Section 2 – Project Description** describes the Lease Modification Project, its location, components, and activities, and describes the decommissioning process and schedule.
- **Section 3 – Cumulative Projects** describes and locates other projects that are considered in the cumulative impact assessment within Section 4.
- **Section 4 – Environmental Setting and Impact Analysis** describes existing environmental conditions, impacts of the Lease Modification Project, mitigation measures, and residual effects for multiple environmental issue areas, and evaluates cumulative impacts.
- **Section 5 – Alternatives** describes the alternatives screening methodology, alternatives screened from full evaluation, and alternatives carried forward for analysis; and analyzes impacts of each alternative carried forward.
- **Section 6 – Other CEQA Sections and Environmentally Superior Alternative** addresses other required CEQA elements, including: significant and irreversible environmental and growth-inducing impacts; comparison of the Lease Modification Project and alternatives; and identification of the environmentally superior alternative.

- **Section 7 – Mitigation Monitoring Program (MMP)** presents the required description of the monitoring process.
- **Section 8 – Other Commission Considerations** presents information relevant to the Commission's consideration of Poseidon's lease amendment application that are in addition to the environmental review required pursuant to CEQA (other considerations may be addressed in the staff report presented at the time of the Commission's consideration of the lease amendment).
- **Section 9 – Report Preparation Sources and References** lists the persons involved in preparation of the EIR and the reference materials used.

The Supplemental EIR also contains the following appendices listed below.

- **Appendix A** – Applicable Federal and State Regulations
- **Appendix B** – Interagency Permit Sequencing Framework Agreement
- **Appendix C** – EIR Distribution List
- **Appendix D** – Notice of Preparation (NOP), NOP Comments, Scoping Hearing Transcripts, and Index to Where Each NOP Comment is Addressed in the Supplemental EIR
- **Appendix E** – Selected Documents Incorporated by Reference
    - **E1** – California State Lands Commission staff report, Mitigation Monitoring Program, and Findings (Item 62, October 29, 2010)
    - **E2** – *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes* (adopted May 6, 2015) (SWRCB 2015a)
- **Appendix F** – Memorandum and Reports on ocean water quality/marine biological issues related to desalination project intake and discharge
    - **F1** – Dr. Peter Raimondi, Review of Applicant-provided information on operational effects of the Huntington Beach Desalination Plant Lease Modifications to marine biology (May 19, 2017).
    - **F2** – TWB Environmental Research and Consulting (Tim Hogan) and Michael Baker International (Dr. Scott Jenkins), Technical Memorandum: Response to SLC Request for Additional Turbulence Mortality Calculation (May 9, 2017)
    - **F3** – Comparison of Selected Southern California Tidal Wetlands as Potential Sites for Mitigation of Impacts Associated with Desalination Projects, 2016 Update (July 2016)

  - **F4** – Poseidon Huntington Beach Desalination Facility Marine Life Mitigation Plan: Bolsa Chica (July 2016)

- **Appendix G** Energy Minimization and Greenhouse Gas Reduction Plan (February 27, 2017 Update)
- **Appendix H** – Discharge Pipeline (Outfall) Technical Memoranda and Reports submitted to CSLC Engineering and Environmental Staffs
  - **H1** – Outfall Diffuser Head Loss Summaries, Calculations, and Related Memos (Alden 2017a/GHD 2017a)
  - **H2** – Response to Request for Information on Possible Effects of Adding Brine into Existing Concrete Discharge Pipeline (GHD 2017b)
- **Appendix I** – Wedgewire Screen and Diffuser Construction: Summary, Harborcraft Assumptions and Emissions, CalEEMod Summer/Annual Outputs

2.0 PROJECT DESCRIPTION

2.1 PROJECT SUMMARY

As discussed in Section 1, *Introduction*, Poseidon Resources (Surfside) LLC (Poseidon or Applicant) is proposing to modify portions of its proposed 50 million gallon per day (MGD) Huntington Beach Desalination Plant (HB Desalination Plant) located on PRC 1980.1, a General Lease – Industrial Use (see Figure 1-1 in Section 1, *Introduction*) offshore the AES Huntington Beach Generating Station (HBGS). In September 2010, the city of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), certified a Final Subsequent Environmental Impact Report (2010 FSEIR) and approved construction and operation of the HB Desalination Plant (2010 Project). The 2010 Project site is located in the northern portion of the HBGS site, in the city of Huntington Beach, in northwestern Orange County (Figure 2-1).

Figure 2-1. HB Desalination Plant with Intake/Discharge Pipelines

Source: Digitalglobe 2007, City of Huntington Beach 2010.

In October 2010, the California State Lands Commission (CSLC), as a CEQA responsible agency, reviewed the City's 2010 FSEIR and authorized the amendment of PRC 1980.1, which covers the existing offshore HBGS seawater intake pipeline and discharge pipeline (outfall) on 11.78 acres of tide and submerged land (Item 62, October 29, 2010).[14] The executed lease, which has a 20-year term (through August 7, 2026), granted Poseidon a vested right to use the pipelines for desalination at the HB Desalination Plant site. The 2010 Project analyzed in the 2010 FSEIR included onshore and offshore elements and two operating scenarios:

- Onshore – reverse osmosis (RO) desalination plant and onshore product water distribution pipelines [15]
- Offshore – offshore pipelines currently used by the HBGS for Once-Through Cooling (OTC) that would also be used by the HB Desalination Plant
- Co-located Operations (concurrent with HBGS OTC flows) – source water for desalination is obtained entirely from the HBGS's effluent stream, and post-desalination wastewater (brine concentrate, filter backwash, and subsequent rinse wastewater, and occasional stormwater) is blended with OTC discharges
- Stand-alone Operation (after HBGS steam generating units are shut down) – all seawater intake and discharge is for desalination operation only (no OTC flow would be available to blend with desalination effluent prior to discharge)

Before the HB Desalination Plant and onshore potable water distribution system can be built and start operations, additional approvals must be obtained from the Santa Ana Regional Water Quality Control Board (RWQCB), California Coastal Commission (CCC), and Orange County Water District (OCWD) or other local or regional water agency. As discussed in Section 1.2.5, *City of Huntington Beach and Orange County Water District*, the OCWD Board approved a non-binding term sheet addressing contracts for water purchased from the HB Desalination Plant in 2015 (OCWD 2015b). The RWQCB, in consultation with the State Water Resources Control Board (SWRCB) and CCC, is also reviewing alternatives to the 2010 Project site pursuant to Water Code section 13142.5 (b).

[14] PRC 1980.1, a *General Lease – Industrial Use*, was previously issued to AES beginning on August 8, 2006, for a 20-year term (Minute Item 43, February 5, 2007).

[15] SWRCB (2015a) Table 12-1 identifies the following facilities associated with the HB Desalination Plant.
Onsite: 10,000 square foot (ft^2) administrative building, 38,090 ft^2 RO building, 38,220 ft^2 pre-treatment filtration structure, 8,500 ft^2 solids handing structure, 4,370 ft^2 chemical storage structure, 1,800 ft^2 electrical substation building, 4,560 ft^2 lime tank farms (6), 200,000-gallon wash water and 100,000-gallon rinse water tanks, one 10,000,000-gallon produce water storage tank, connecting pipeline from HBGS cooling water conveyance, and effluent pipeline to existing HBGS discharge
Offsite: 52,800 feet of 48-inch diameter water distribution pipeline, and two booster pump stations

This Supplemental EIR addresses only the Lease Modification Project (i.e., the proposed modifications to the approved 2010 Project that lie offshore within the PRC 1980.1 footprint) which includes one operational change and two physical modifications offshore intended to address Santa Ana RWQCB and CCC policies and regulations.

- Reduce seawater intake volume to up to 127 MGD (co-located) and 106.7 MGD (stand-alone) to produce an average 50 MGD of potable water
- Install wedgewire screens and a multiport diffuser at the ends of the existing HBGS intake and discharge pipelines, respectively (as required for Poseidon to operate the seawater intake pump for the HB Desalination Plant and to discharge brine and other desalination wastes)—if the Santa Ana RWQCB, pursuant to Water Code section 13142.5, subdivision (b), determines subsurface intakes are not feasible, and brine cannot be diluted by wastewater and there are no live organisms in the discharge—consistent with 2015 Ocean Plan Desalination Amendment Chapters III.M.2.d(1)(c)(i) and III.M.2.d(a),(b)

Poseidon has identified one Applicant Proposed Lease Condition (APLC) and ~~seven~~ eight Applicant Proposed Measures (APMs), which would be implemented to avoid or minimize construction and operational impacts associated with the screens and diffuser. (See discussion in Section 2.5, *Applicant Proposed Measures*. The full text of each APM is included in Section 4.0, *Environmental Setting and Impact Analysis*.)

2.2 PROJECT OBJECTIVES

The State CEQA Guidelines (§ 15126.6, subd. (a)) require an EIR to describe and consider a range of reasonable alternatives to a project, or project location, which would feasibly attain most of the basic objectives of the project. Here, project objectives identified in the 2010 FSEIR are presented to explain the previously-approved need for the HB Desalination Plant and to guide in development and evaluation of alternatives. Consistent with the 2010 FSEIR and Poseidon's executed lease, this Supplemental EIR incorporates these objectives within the context of Poseidon's application to amend PRC 1980.1. These objectives are:

- Use proven technology to affordably provide a long-term, local and reliable source of water not subject to the variations of drought or regulatory constraints
- Reduce local dependence on imported water and strengthen regional self-reliance
- Contribute desalinated water to satisfy regional water supply planning goals

Poseidon's objectives also include obtaining:

- RWQCB determination of consistency, in consultation with the SWRCB, with Water Code section 13142.5, subdivision (b), as implemented through the Ocean

Plan (hereinafter referred to as the Desalination Amendment) and issuance of a National Pollutant Discharge Elimination System (NPDES) permit

- CCC approval under the California Coastal Act (Pub. Resources Code, § 30000 et seq.)

2.3 EXISTING CONDITIONS—HBGS

The HBGS began operation in 1958 under the ownership of Southern California Edison (SCE). In 1998, AES Huntington Beach, LLC, acquired the HBGS from SCE. In 2014, the California Energy Commission (CEC 2014a) approved the replacement of the HBGS with the Huntington Beach Energy Project, a natural-gas-fired, air-cooled electrical power plant (CEC 2014a). Demolition within the HBGS site has begun (see Section 3.2, *Cumulative Project List*).

The HBGS currently has two seawater cooled operating units that are scheduled to cease by December 31, 2020. OTC flows are withdrawn and discharged through a 14-foot-diameter pipeline ending in a vertical riser (tower) as shown in Figures 2-2 and 2-3.

2.3.1 Existing Intake System

Cooling water is withdrawn from the ocean through a concrete conduit with internal dimensions of 14 feet (inside diameter). As described in Order No. R8-2014-0076, NPDES No. CA0001163 (Santa Ana RWQCB 2014 [Attachment F Fact Sheet]) for the HBGS, the intake conduit extends approximately 1,650 feet offshore. At the intake end, which lies at a depth of about 33 feet mean lower low water, a vertical riser with internal dimensions of 21 feet by 16 feet elevates the inlet 11.7 feet above the sea floor to minimize direct disturbance to the sea floor that may result from currents created by the intake flow (Figure 2-2). The riser is fitted with a velocity cap that reduces entrainment of motile fishes through the intake conduit by creating a rapid directional change in the inflow current, thereby triggering a flight response in many fish. Maximum mean water velocity at the cooling water conduit inlet is 2.0 feet per second (ft/s).

OTC water is drawn into the HBGS by six circulating water pumps, each capable of delivering about 44,000 gallons per minute (63.4 MGD) for a

Table 2-1. AES HBGS Intake Volumes: 2016-2017 (MGD)

Month	Average/Month	Maximum
Apr 2016	70.3	N/A
May 2016	94.2	N/A
Jun 2016	293.3	293.3
Jul 2016	243.4	302.0
Aug 2016	263.0	293.0
Sep 2016	195.8	291.7
Oct 2016	116.3	253.4
Nov 2016	105.5	261.9
Dec 2016	88.0	253.4
Jan 2017	64.1	72.8
Feb 2017	68.9	126.7
Mar 2017	65.5	105.3

Source: California Integrated Water Quality System (http://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=esmrAnalytical)

maximum of about 387 MGD. In the 12-month period between April 2016 and March 2017, average intake flow varied between 64 MGD and 293 MGD, with a maximum of 302 MGD, as reported by AES through the California Integrated Water Quality System (Table 2-1).

Figure 2-2. Existing Intake Structure

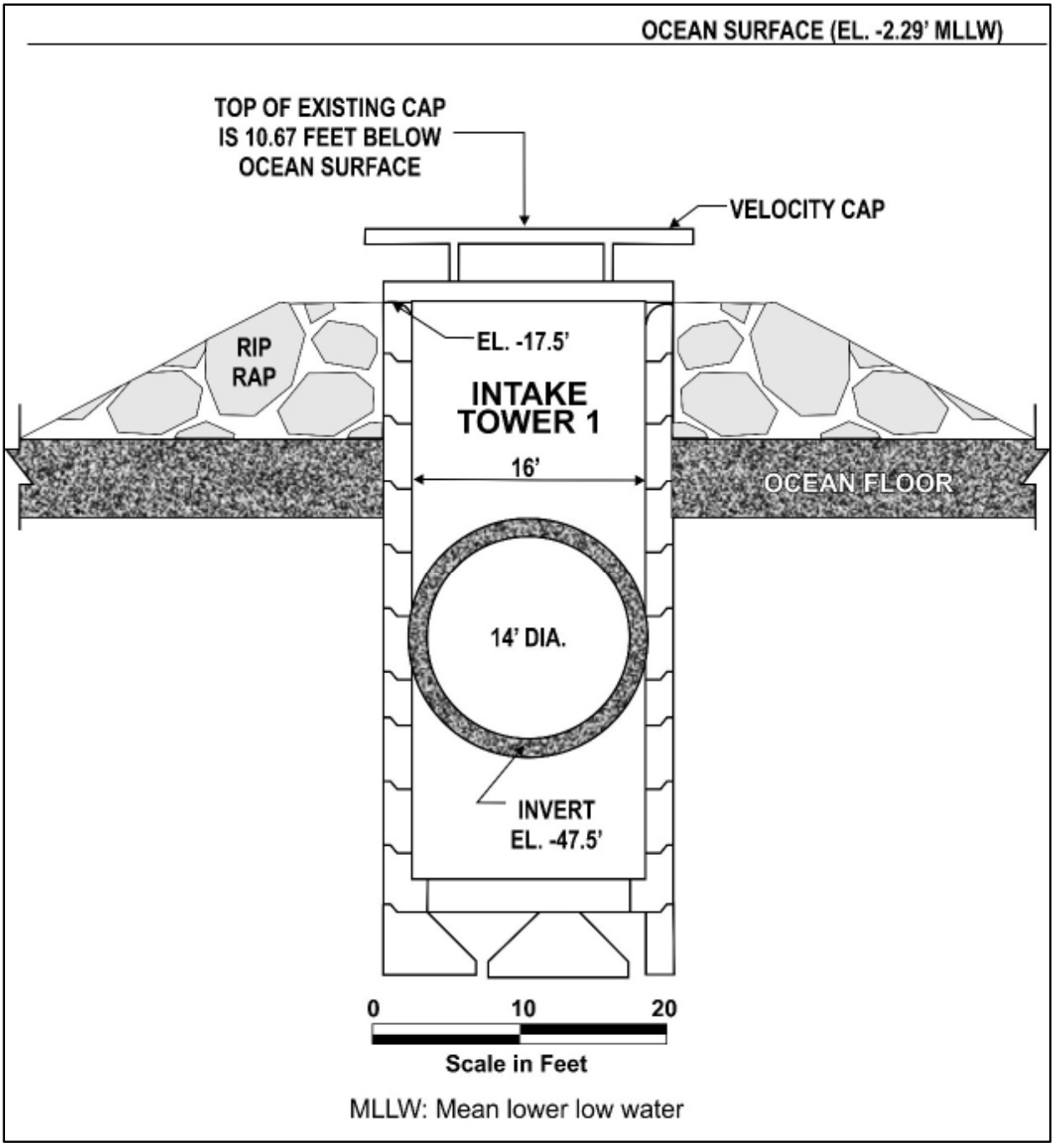
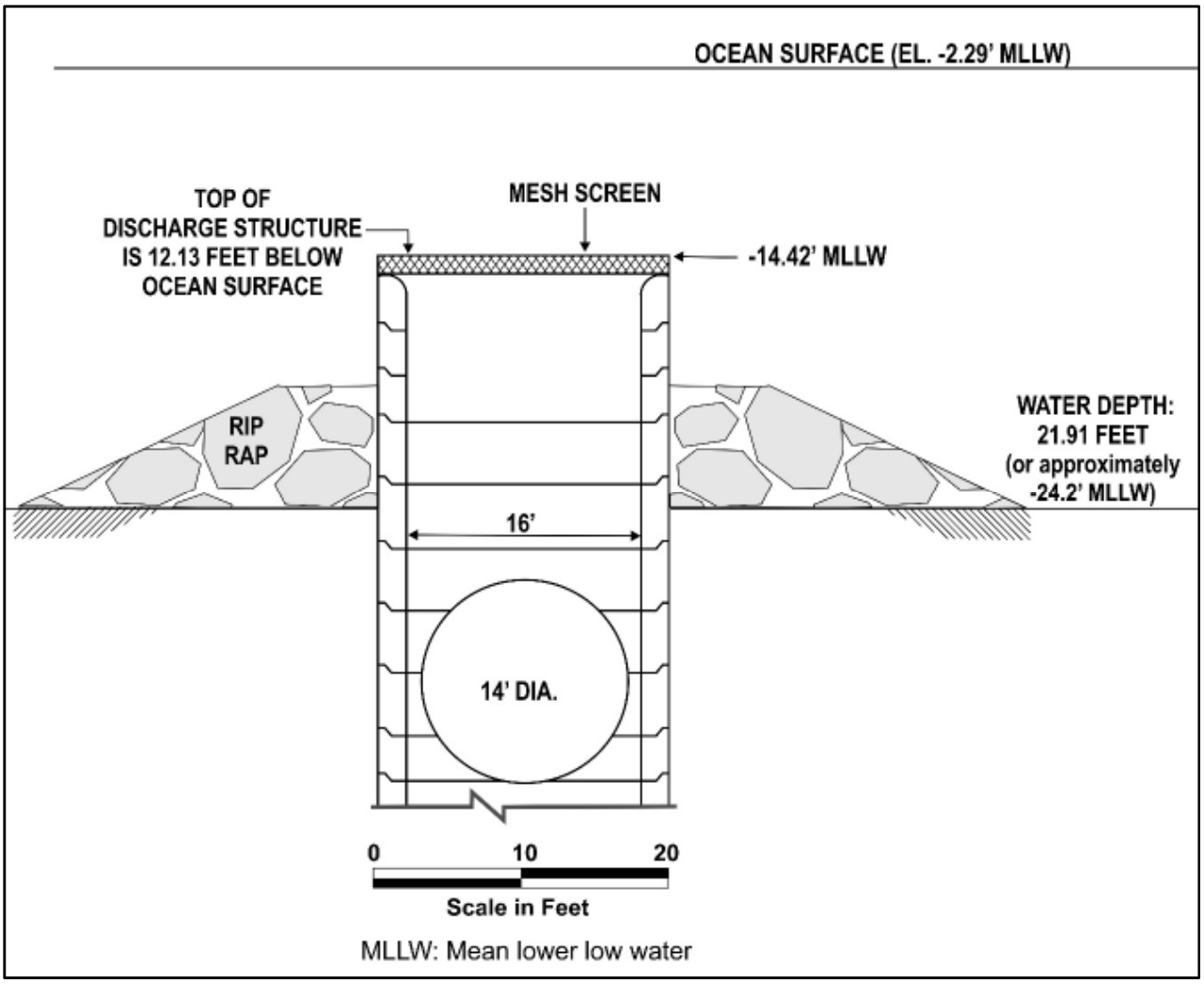


Figure 2-3. Existing Discharge Structure



2.3.2 Existing Outfall System

After flowing through the HBGS, cooling water is collected from the power plant's steam generating units into a discharge well located within the HBGS. Cooling water flow is conveyed from the discharge well back to the ocean via a 1,500-foot-long outfall with a vertical riser similar to that on the intake structure. The riser is capped with a 12-inch by 18-inch mesh screen constructed of 1-inch by 3-inch flat bars (Figure 2-3). AES has inspected the outfall on several occasions between 2010 and 2016, most recently in late December 2016 (Poseidon 2017b).

2.4 DESCRIPTION OF PROPOSED LEASE MODIFICATION PROJECT

Table 2-2 identifies Poseidon's proposed Lease Modification Project components, which include seawater intake volume reductions and installation of screens and a diffuser, and presents proposed average production, intake, and discharge volumes.

Table 2-2. Lease Modification Project "At a Glance"

Product (potable) water volume		50 million gallons per day (MGD)
HB Desalination Plant Intake: Wedgewire screens	Timing	Install prior to desalination plant commercial operation
	Location	At intake pipeline riser ~ 1,650 feet offshore
	Quantity/ Description	Four, 91-inch-diameter, cylindrical screens Overall length for each: 26 feet Effective screen area for each: ~ 105 inches. Orientation: perpendicular to shoreline
	Slot width	1 millimeter (mm)
	Through velocity	0.5 feet/second or less (per Ocean Plan Section III.M.2.d(1)(c) requirements)
	Composition	~~Copper nickel alloy~~ Stainless steel
	Volume	Up to 127 MGD (co-located; with screens) [1] 106.7 MGD (stand-alone; with screens) ✓ 152 MGD intake volume approved in 2010
HB Desalination Plant Discharge Multiport diffuser (March 2017 design)	Timing	Install prior to desalination plant commercial operation
	Location	At discharge pipeline riser ~ 1,500 feet offshore
	Number of ports[2]	Three 36-inch duckbill check valves and one 54-inch (4.5-foot) capped port (port open only for flows > 127 MGD and prior to Desalination Plant commercial operations)
	Alignment	45° (horizontal angle between check valves) 47° (vertical angle for each valve)
	Effluent Composition	Brine concentrated seawater, filter backwash, ~~and~~ subsequent rinse wastewater, and occasional stormwater
	Initial discharge velocity	11.9 feet/second (co-located) 10.1 feet/second (stand-alone)
	Discharge volume (co-located)	56.7 to 77 MGD (diffuser with 54-inch port capped)[3] ✓ 514 MGD 2010 Project discharge volume ✓ 387 MGD maximum in current AES HBGS NPDES Permit
	Volume (stand-alone)	56.7 MGD (proposed; with diffuser)

Source: Alden 2017a

Notes:

[1] The OTC Policy prohibits the HBGS from withdrawing seawater solely for the purpose of providing the HB Desalination Plant with source water.

[2] Per Poseidon, the number and diameter of diffuser valves will allow for either co-located or stand-alone operation.

[3] The maximum discharge volume depends on AES drawing the full 127 MGD for one generating unit during co-located operations.

2.4.1 Poseidon's Proposed Schedule

The 2010 FSEIR analysis used a construction schedule for the HB Desalination Plant that began in 2011 and ended in 2013 and included the construction timing for: (1) the onsite desalination facility; (2) offsite product water transmission pipeline; and (3) offsite pump stations (Table 2-3). The 2010 FSEIR also noted that these three components would be implemented concurrently during the 18 months that the pump stations would be under construction and that construction phasing would not change under the stand-alone condition.

Table 2-3. Schedule for 2010 Project (as Described in 2010 FSEIR)

Onsite: Desalination Facility Construction	• Approximately 24-month construction period • Includes on-site demolition, grading/excavation, construction of desalination facilities, landscaping, and facility startup/testing • Import and export of earthen materials would occur primarily during first 6 months and last 4 months of this phase of the project
Offsite: Product Water Transmission Pipeline Construction	• Approximately 21-month construction period • Begin about 3 months after the beginning of on-site desalination facility construction • Includes pipeline installation, pipeline implementation under waterways and major roadways, soil remediation, pipeline removal, and facility startup/testing • Import and export of earthen materials would occur primarily during middle 12 months of this phase
Offsite: Product Water Underground Booster Pump Stations Construction	• Approximately 18-month construction period • Begin approximately 6 months subsequent to commencement of on-site desalination facility construction • Includes grading/excavation/paving, pump station construction, emergency power generator construction, landscaping, and facility startup/testing • Import and export of materials would occur mainly within first 6 months and final 6 months of the phase

The 2010 FSEIR construction schedule did not include offshore work on the HBGS intake and discharge pipelines, which is the subject of analysis in this Supplemental EIR. The Applicant's proposed updated construction schedule (see Table 2-4) includes similar construction phases and durations to those listed in the 2010 FSEIR. The construction start dates for the main onshore construction activities—onshore components (at the HB Desalination Plant site) and offsite potable water distribution infrastructure (transmission pipeline and pump stations)—were revised to include the offshore intake and discharge pipeline modifications and to incorporate the anticipated shut down and decommissioning of the HBGS by December 31, 2020. Construction would occur while the HBGS is offline (typically during winter months when electricity demand is lower).

Table 2-4. Applicant Proposed Schedule (Lease Modification Project)

Lease Modification Project	**Diffuser Installation**	• Approximately 2-month construction period • Begin construction on discharge pipeline as early as late 2019 (before HBGS is decommissioned) • Diffuser construction period is anticipated to overlap with construction of components on desalination plant site and offsite distribution system components (i.e., pipeline and pump stations) • Diffuser's 54-inch port would be capped after installation if flows are reduced from > 127 MGD to ≤ 127 MGD
	Wedgewire Screen Installation	• Approximately 3-month construction period • Begin as early as 2020, prior to commercial operation of the HB Desalination Plant (start of screen installation work would be tied to the decommissioning schedule for HBGS since screens cannot be installed when OTC flow is > 127 MGD) • Installation of wedgewire screen would likely occur after installation of diffuser on discharge pipe, but construction periods could overlap • Construction schedule for screen installation would overlap with construction of onshore desalination components (similar to above)
Other 2010 Project Components • Onshore at Plant Site • Offsite Pipeline • Offsite Pump Stations		• All estimated to begin construction in 2018, with commercial operation of the facility beginning in the first quarter of 2021 • Approximately 24-month construction time for main components being built on the desalination plant site (anticipate completion of construction in late 2020) • Approximately 21-month construction period for offsite (onshore) pipeline and 18 months for pump stations (anticipate completion of pipeline alignment and pump stations in 2020) • All three components would overlap during construction

Note: All components begin after Poseidon has obtained its required approvals.

2.4.2 Operational Scenarios

Poseidon would install the 1-mm wedgewire screens and multiport diffuser prior to commercial operation, as per the Desalination Amendment.[16] If it obtains all required

[16] The Desalination Amendment to the Ocean Plan (SWRCB 2015b) includes, but is not limited to, the following requirements to protect marine life associated with desalination project surface intake and discharge.

- Surface water intakes must be screened with a 1 millimeter (0.04 inch) or smaller slot size screen when the desalination facility is withdrawing seawater.
- In order to minimize impingement, through-screen velocity at the surface water intake shall not exceed 0.15 meters per second (0.5 foot per second).
- Multiport diffusers are the next best method for disposing of brine when the brine cannot be diluted by wastewater and when there are no live organisms in the discharge. Multiport diffusers shall be engineered to maximize dilution, minimize the size of the brine mixing zone, minimize the suspension of benthic sediments, and minimize mortality of all forms of marine life.

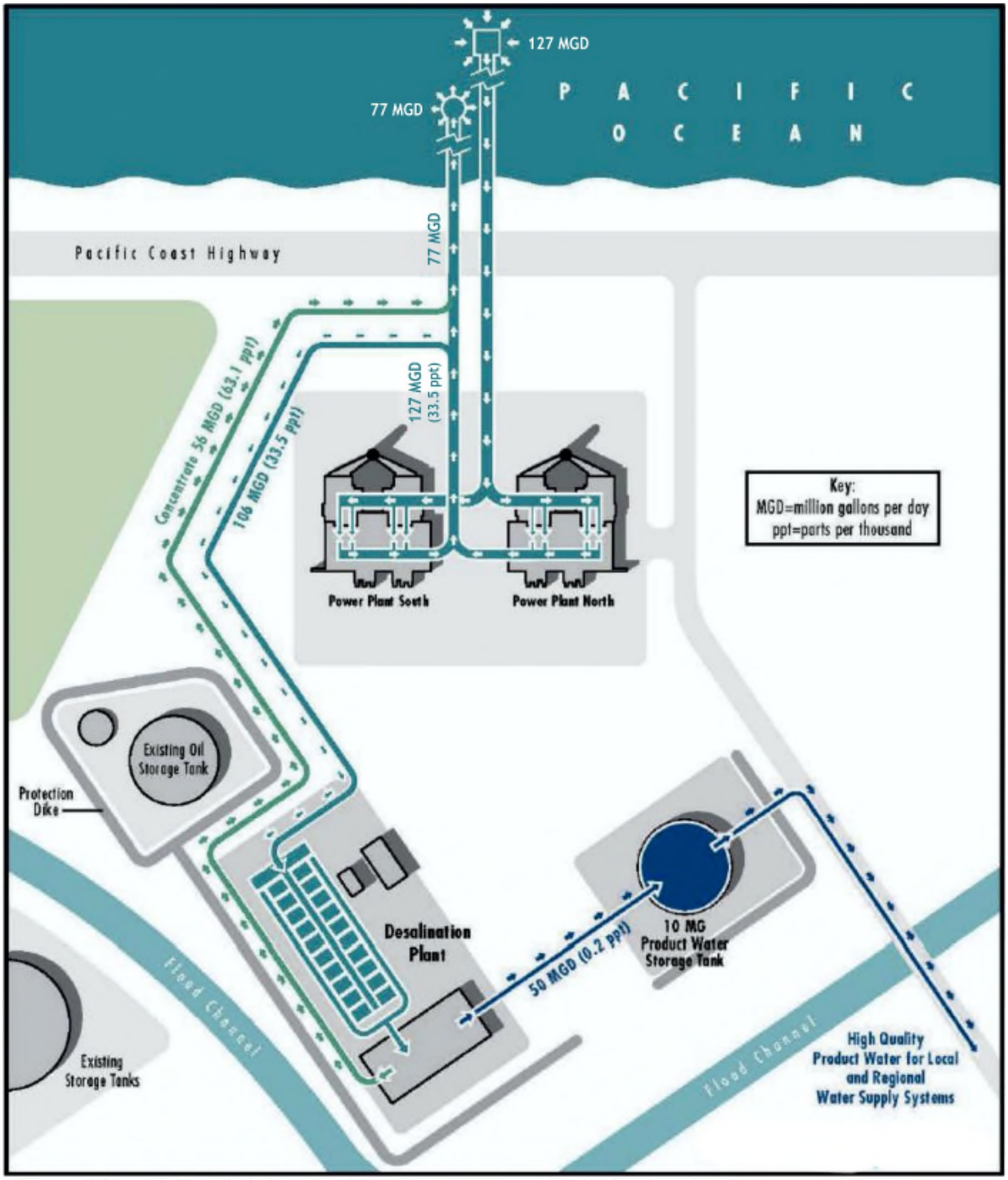
permits, Poseidon anticipates beginning commercial operation of the HB Desalination Plant in the first quarter of 2021 (see schedule in Table 2-4).

Poseidon proposes to primarily operate the HB Desalination Plant under stand-alone conditions. However, if the SWRCB extends the deadline for cessation of HBGS OTC flows past 2020, there may be a period when the HB Desalination Plant would operate in a co-located mode with one of the HBGS power generating units in operation. During this co-located mode, the intake water would pass through the wedgewire screen. Poseidon has proposed a diffuser and wedgewire screen design that allows for both stand-alone operation and short-term co-located operations. Figures 2-4 and 2-5 illustrate the HB Desalination Plant process under co-located operations and stand-alone scenarios, respectively.

- A single pump station would provide the HB Desalination Plant's source water from the Pacific Ocean using the existing HBGS intake and outfall pipelines (operation of the HB Desalination Plant will not involve mixing and matching pump operations from the HBGS pump station and desalination plant station). Aside from a connection point within the HBGS site, no modifications to the HBGS would be required to support the HB Desalination Plant.
    - Under co-located operations, the HBGS OTC pump would be used. The facility would only operate in co-located mode if the HBGS's OTC system is operating with no more than 127 MGD (equivalent to one unit operating), which is the maximum volume of water the wedgewire screen can accommodate. The HB Desalination Plant would then withdraw its source water from the wastewater effluent stream of the HBGS and convey it to the desalination plant intake pump station via a 72-inch pipeline located entirely within the existing HBGS site.
    - Under stand-alone operation (once HBGS OTC flows cease), the HB Desalination Plant pump station would directly intake and discharge seawater from/to the Pacific Ocean. Average annual seawater withdrawal would be approximately 106.7 MGD.
- The HB Desalination Plant pump station would contain three vertical turbine pumps[17] of approximate capacity of 50 MGD each, with a nominal capacity of 106.7 MGD. Only two of the three pumps would operate at a time ~~(100 MGD total);~~ the third would be on standby.

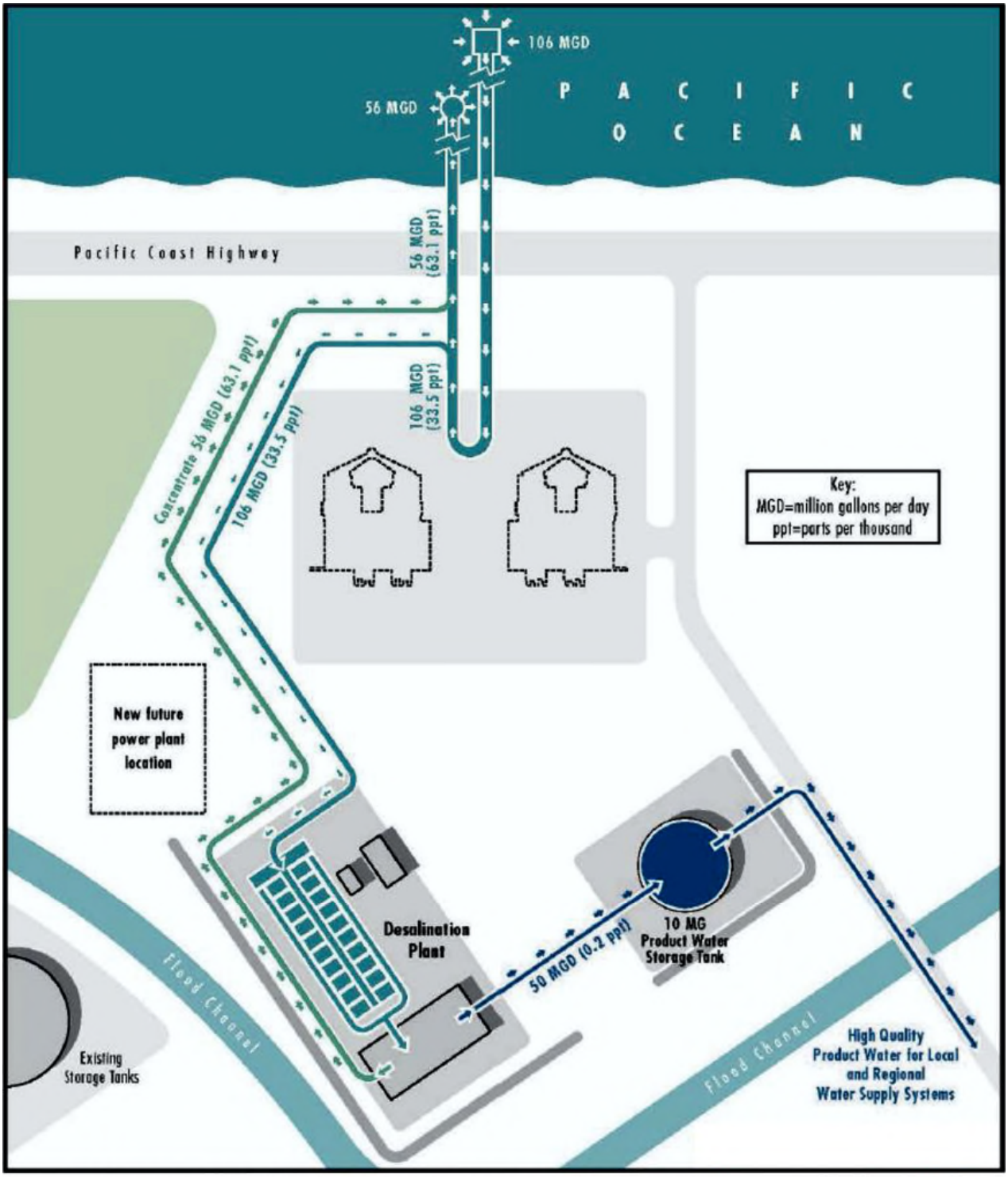
[17] Poseidon has informed CSLC staff that it may make a future business decision to change the number of onshore vertical turbine pumps from three to five (with one on standby) for operating efficiency and flexibility after the HBGS ceases OTC. Poseidon currently has no plan to change the number of pumps at this time; however, if five pumps are selected they would be smaller and the energy consumption guarantee from Poseidon's Process Provider would remain unchanged. (Email from Scott Maloni, Poseidon, to Cy R. Oggins, CSLC, May 11, 2017.)

Figure 2-4. Co-located Operations



Source: Alden Research Laboratory, Inc. 2016, as presented in Dudek 2016 (modified by Aspen Environmental Group).

Figure 2-5. Long-Term Stand-Alone Operations



Source: Alden Research Laboratory, Inc. 2016, as presented in Dudek 2016.

- Under co-located operations, the pumps would only operate when source water is available from HBGS discharge. Post-desalination discharges would be commingled with HBGS OTC discharges.
- Under stand-alone operation, no commingling would occur (HBGS OTC flows will have ceased).

Of the 106.7 MGD of seawater intake used for desalination, after producing 50 MGD of potable water, approximately 56.7 MGD (50 MGD of brine from the RO process, ~~and~~ 6.7 MGD of seawater for filter backwash and subsequent rinsewater, and occasional stormwater) would be discharged through the multiport diffuser, with the central port closed. The initial discharge velocity through the three 36-inch duckbill valves would be approximately 12 ft/s for co-located operations and 10 ft/s for stand-alone operations, with a salinity of 63.1 parts per thousand (ppt) (see Table 2-2 above).

2.4.3 Wedgewire Screen Intake Design and Materials

To reduce entrainment of marine life, a wedgewire screen manifold would be installed before commercial operation of the HB Desalination Plant (after AES decommissions either one or both of the two HBGS units). Figure 2-6 shows photographs of similar screens used for other projects.

Figure 2-6. Wedgewire Screen Photographs

Source: WE Energies, Filtration-Separation.com and Cook Legacy Water & Energy 2013

Figure 2-7a illustrates the shape and dimensions of the proposed HB Desalination Plant screens in plan and profile views. The existing HBGS intake tower would be modified to add the manifold with four, 91-inch-diameter, 1-mm slot cylindrical wedgewire screens (three main operating screens and an additional one for redundancy). Each screen would rise approximately 13.5 feet above the sea floor and be oriented perpendicular to the shoreline. Screen lengths would be about 26 feet, each with an effective screening area of approximately 105 inches. This would increase the size and shape of the intake facilities on the ocean floor and increase the footprint, including protective riprap, by 608 square feet, to include approximately 1,319 square feet not within the existing intake facility footprint (see Figure 2-7b). Screens would be spaced approximately 3.8 feet from each other to maximize the sweeping velocities between screens to sweep debris and organisms away from the intake area. The proposed screens would be constructed of ~~a copper nickel alloy~~ stainless steel, which has been shown to provide the greatest resistance to ~~biofouling~~ corrosion with no chemical leaching.

2.4.4 Diffuser Design

Prior to operation of the HB Desalination Plant, Poseidon proposes to install a diffuser with three 36-inch duckbill valves and one 54-inch central port on the HBGS discharge tower (Figure 2-8a). Brine and other desalination effluent (e.g., filter backwash water and subsequent membrane rinse flow, and occasional stormwater) would be discharged from the submerged diffuser through multiple high velocity ports. This discharge would be mixed with the receiving waterbody to reduce salinity and encourage dispersion of the plume. The number and diameter of the valves were selected to produce an initial discharge velocity of approximately 12 or 10 ft/s when the HB Desalination Plant is in operation for either co-located or stand-alone operations, respectively (Alden 2017a). The purpose of the diffuser is to reduce salinity in the concentrated discharge from the HB Desalination Plant to comply with Desalination Amendment receiving water limits of 2 ppt above natural background salinity (approximately 35.5 ppt) at the edge of the Brine Mixing Zone (BMZ) of 328 feet.

The diffuser's duckbill valves would be generally oriented to provide a net offshore momentum. The horizontal angle between the valves would be 45 degrees to provide flow separation for entrainment of ambient ocean water into each discharge jet and to fit the pipes into the available space. Flow to the valves would come from a new common space (plenum) under the tower cap, which would otherwise be sealed. The plenum with imbedded pipes would sit on top of the tower after the existing grating is removed and the tower is lowered to maintain the existing tower height with the diffuser in place; all other existing elements of the tower and discharge pipeline would be used (Alden 2017a). The diffuser modification would occupy the same physical space as is currently occupied by the discharge tower, while riprap surrounding the discharge tower would be sidecast and reconfigured, increasing the area footprint, (including the protective riprap) by approximately 4,000 square feet (see Figure 2-8b).

Figure 2-7a. Wedgewire Screen Shape and Dimensions

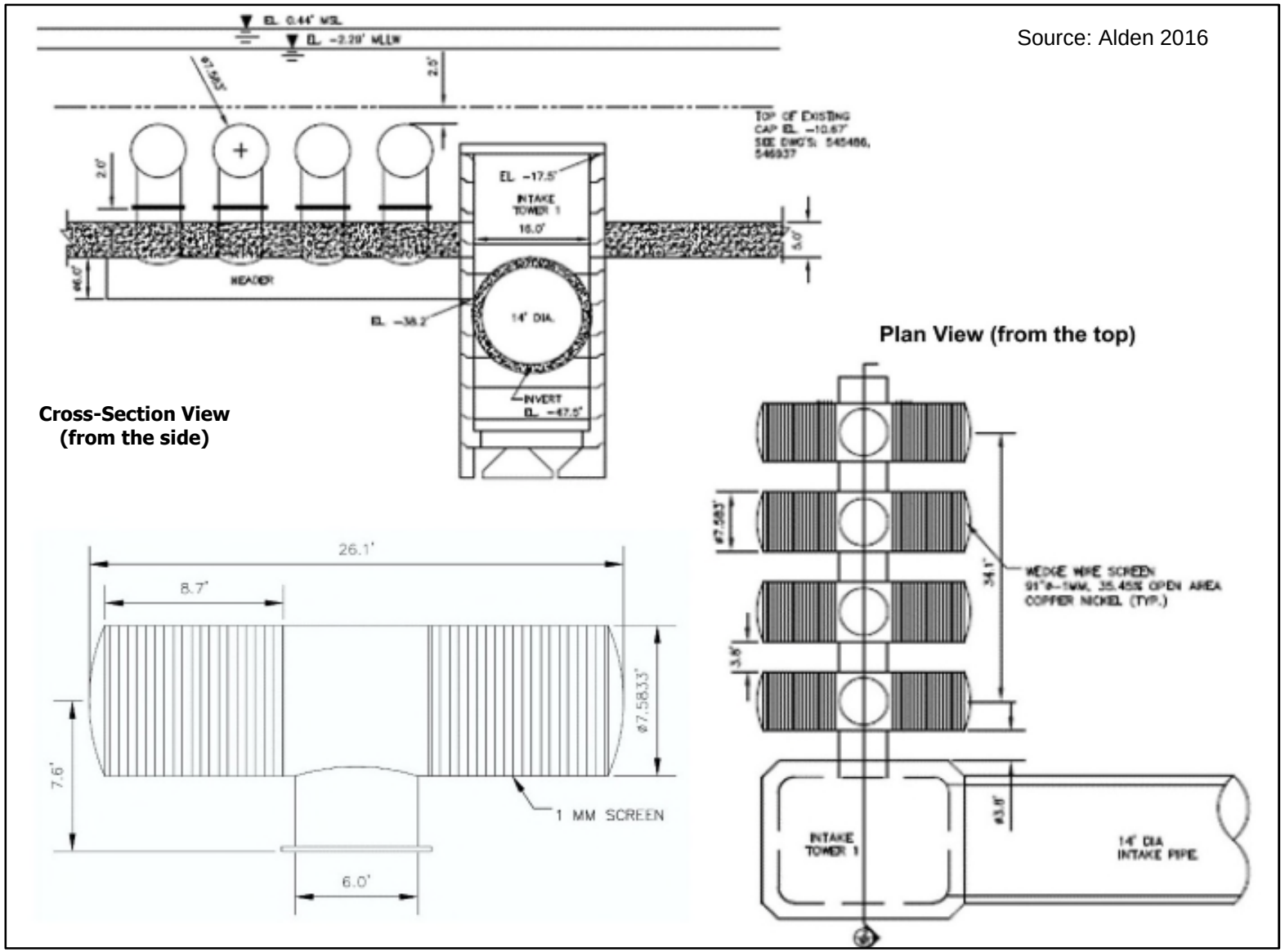
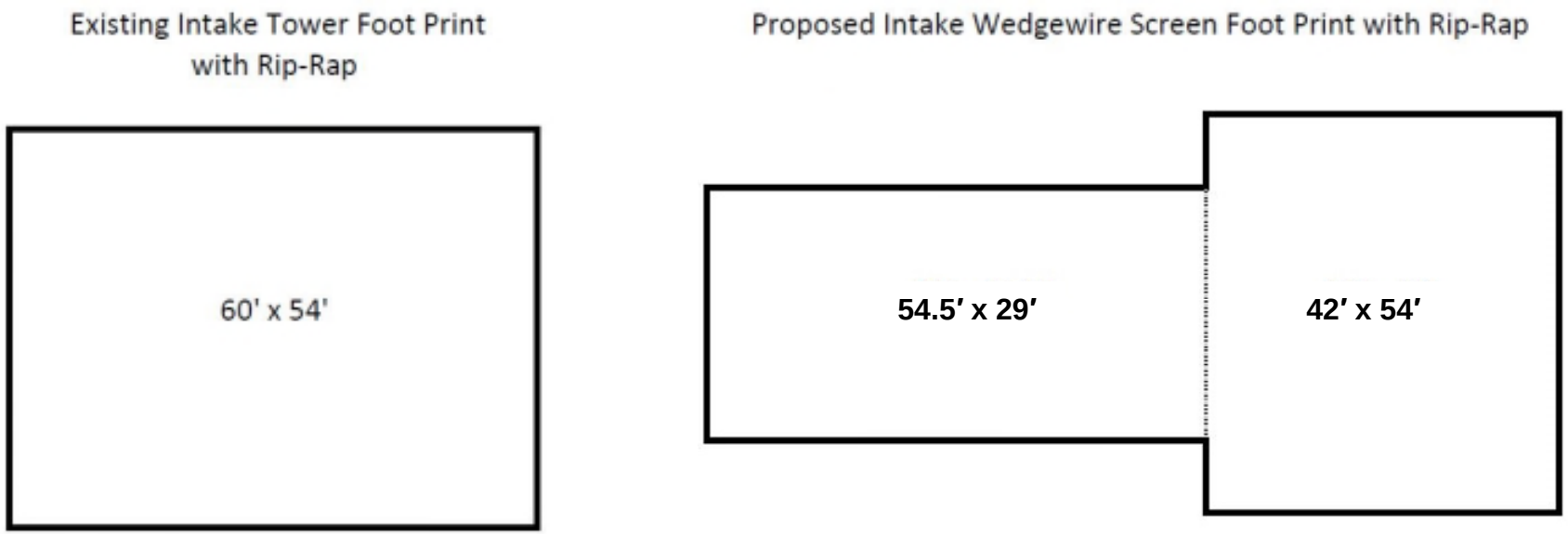


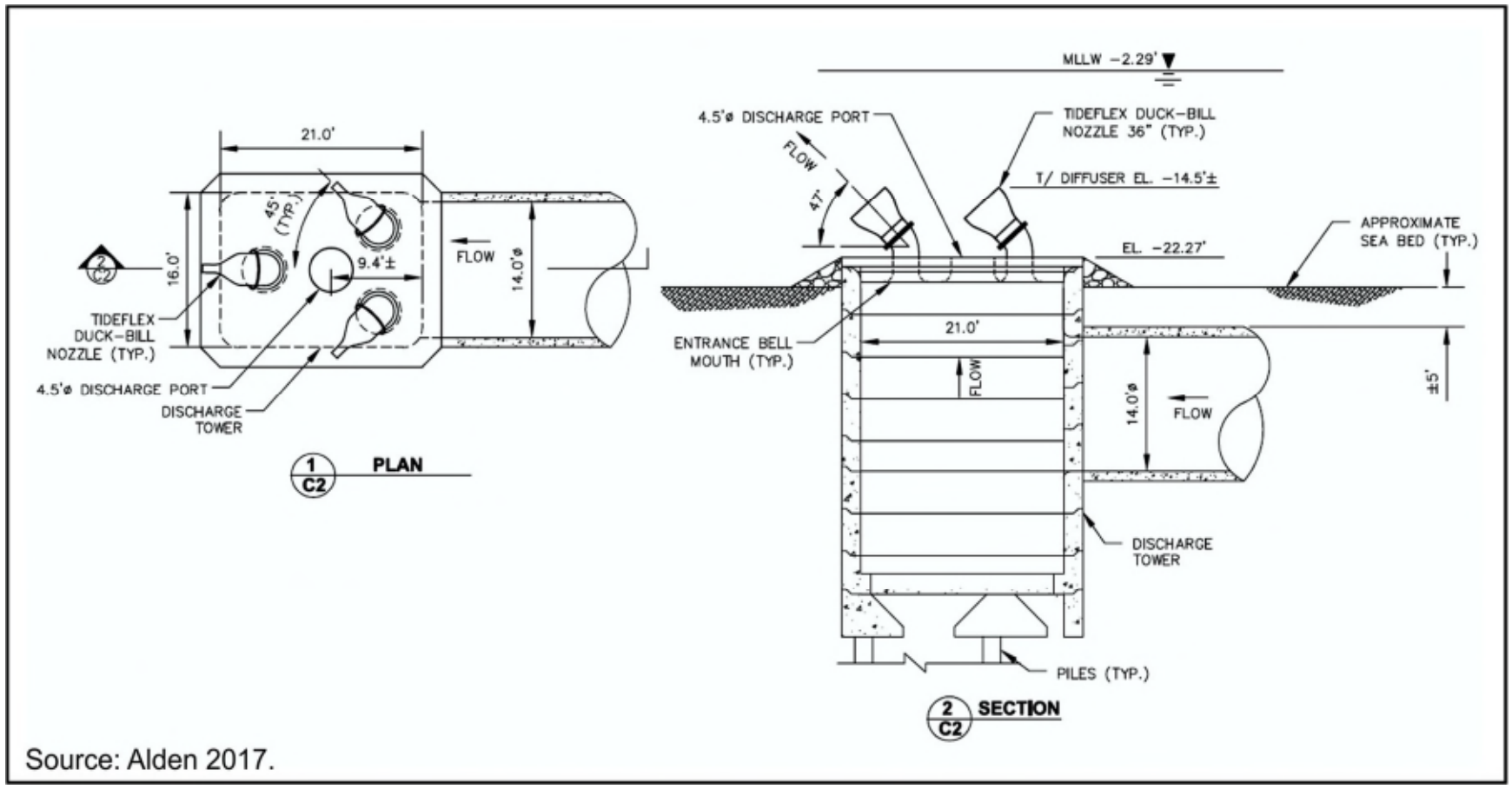
Figure 2-7b. Existing and Proposed Intake Structure Footprint



Benthic Impact from Intake Structure	
Existing Impact Area	3,240 square feet
Proposed Impact Area	3,848 square feet
Increase in Impact Area	608 square feet
Temporary Impact from Intake Structure Construction	
Installation of Wedgewire Screen Pipeline Header	19,481 square feet plus anchors

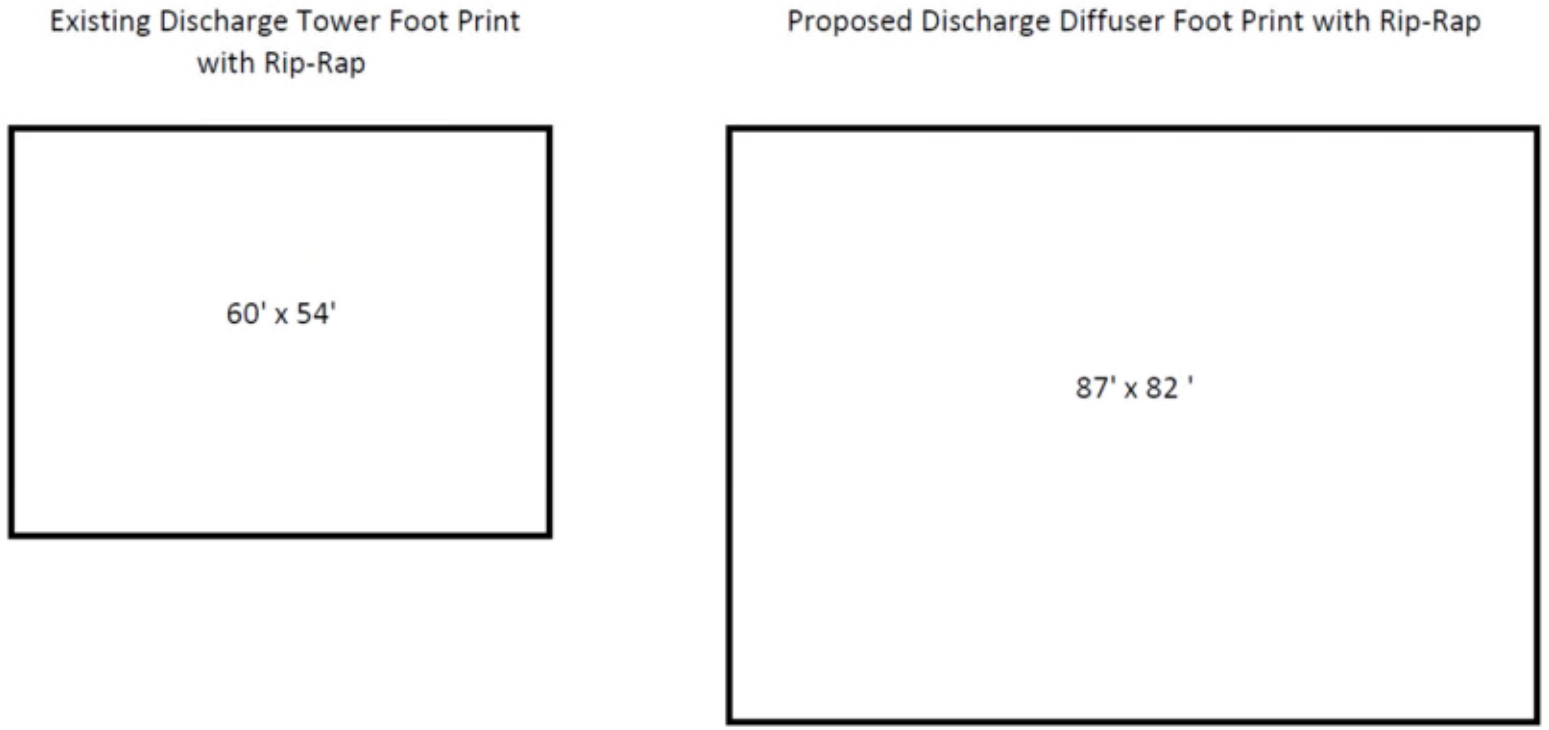
Source: Poseidon.
Note: Disturbance calculation assumes trench construction with a 10-foot x 12-foot trench and a 6:1 slope, resulting in disturbance over an area of 154 x 126.5 feet

Figure 2-8a. Duckbill Diffuser with Center Port



Source: Alden 2017.

Figure 2-8b. Existing and Proposed Discharge Structure Footprint



Benthic Impact from Discharge Structure	
Existing Impact Area	3,240 square feet
Proposed Impact Area	7,134 square feet
Increase in Impact Area	3,894 square feet
Temporary Impact from Discharge Structure Construction	
Anchor disturbance only	

The inclusion of the central port is an insurance (precautionary) measure to mitigate schedule risk as the central port would allow the diffuser to be installed prior to the HBGS decommissioning the first of their two remaining power generating units and prior to the start of HB Desalination Plant operations. This would allow diffuser installation to accommodate construction schedule constraints such as weather, rough seas, and marine equipment availability. The diffuser must be designed and built in advance of its installation. If one or both HBGS units ceases OTC flows prior to the diffuser construction phase (diffuser installation anticipated in late 2019), the diffuser would be installed with the central port capped (permanently closed). If neither unit has ceased OTC flows then the diffuser would be installed with the central port open to accommodate up to 254 MGD discharge from the two operating HBGS units. Under this condition (central port open), HBGS could continue to operate and the HB Desalination Plant could undergo limited "wet commissioning" (such as introducing seawater into the system at the end of construction and conducting hydraulic flow testing of pumps and pressure testing of piping systems) prior to decommissioning one of the HBGS units. The central port would be capped after AES discontinues use of OTC for one of the two power generating units. The 54-inch port would not be opened during the operational phase of the HB Desalination Plant. The seal would be created by ensuring that a uniform surface is present between the mating surfaces of the concrete block and the diffuser structure to prevent gaps which could allow leakage.

The cap on the central port would consist of a concrete block, designed to be heavy enough to withstand the force of the discharge at the end of the pipe, which creates an upward force on the diffuser cap (Alden 2017a). The cap would be sized to overcome the buoyant force and the maximum pressure inside the diffuser with a suitable factor of safety. The construction details of the cap (concrete block) and the top of the diffuser where the central port is located would be defined as part of the detailed design, which will be performed by Poseidon after the start of the design/build process. If recommended in the detailed design phase of the cap, anchors may be included to secure the cap to the top of the diffuser.

2.4.4.1 Structural Integrity of Outfall Pipeline

<u>2010 Analysis of Adding a Diffuser to the Existing Pipeline</u>

The existing discharge pipeline for the HBGS is a 14-foot-diameter concrete pipe that was constructed in the early 1960s. The 2010 FSEIR assumed the 2010 Project would use the existing pipelines with no modifications (page 6-38). In reviewing the whole of the 2010 Project, the City considered an alternative of placing diffusers on the outfall. Appendix AC of the 2010 FSEIR (Supplemental Report on the Effects of a Retrofitted Diffuser on the Discharge Outfall for the Ocean Desalination Project at Huntington Beach, CA [Jenkins and Wasyl 2005, updated 2010]) states in part (page AC-1):

> *[O]nly a handful [of diffuser designs used in ocean outfalls] would be practical for retrofitting to the existing outfall tower of the AES Huntington Beach Generating Station. These diffuser designs are constrained by the hydraulic design parameters of the existing sea water circulation system, in particular the design pressure and gradient along the discharge pipeline. The existing discharge pipeline was not designed for high levels of pressure, which immediately rules out conventional multi-ported diffusers that utilize many small diameter diffuser ports to create high velocity, super-critical discharge jets to induce initial dilution. If retrofitted to the discharge tower, such designs would result in too much back pressure for the existing pipeline to maintain structural integrity. The existing discharge tower produces a discharge point about mid-depth in the water column, making the retrofit of a conventional diffuser with lateral discharge arms infeasible from a structural strength and support perspective.*

The 2010 FSEIR further stated (page 6-38):

> *The existing discharge tower produces a discharge point about mid-depth in the water column, making the retrofit of a conventional diffuser with lateral discharge arms infeasible from a structural strength and support perspective. Given these structural limitations of the existing infrastructure, it appears that the only viable diffuser concept is a velocity cap retrofitted to the discharge tower, identical to the one that already exists on the intake tower. A velocity cap would provide four lateral diffuser ports with rectangular cross section, producing four horizontal discharge jets.*

However, the City concluded that "the diffuser discharge alternative does not provide substantial benefits in terms of impact avoidance or reduction, and is therefore not being further considered" (2010 FSEIR page 6-39).

Diffuser Operation

Installing a multiport diffuser with duckbill valves on the existing outfall tower would force the effluent though the smaller openings (compared to that of the existing open top tower). This would in turn (1) increase the effluent discharge velocity and (2) increase the water pressure (back-pressure) within the tower and pipeline. Poseidon has provided two engineering studies of projected outfall pipeline back-pressure, in terms of head loss, resulting from adding a multiport diffuser (Alden 2017a, Alden 2017b).[18] In addition, in a review of the design capacity of the existing pipeline under the following baseline conditions, GHD (2017a) reported the following.

[18] Head loss is the pressure lost to friction by water (H_2O) flowing in a pipe as a result of turbulence caused by the velocity of the flowing water and the roughness of the pipe, channel walls, or restrictions caused by fittings (measured in feet H_2O).

- **Maximum design flow, original conditions**. The discharge facilities were designed to carry discharge cooling water from four power generating units at 514 MGD. Under these original conditions and design flow conditions, the head loss ranged from 5.46 to 5.83 feet of water elevation head (feet H_2O).
- **Maximum flow, existing conditions**. Currently, generating Units 1 and 2 are in operation and Units 3 and 4 are operating in a synchronized condenser (a device that is not connected to anything but spins freely) mode (using little or no cooling water), for a total of up to 387 MGD. Under these baseline flow conditions, the head loss ranges from 4.88 to 5.12 feet H_2O.
- **Effect on system pressure**. Reduced flow (from 514 to 387 MGD) in the system from original design to existing conditions would reduce system pressure by 10 to 13 percent. When the HBGS ceases OTC use, the reduction in the volume of water discharged from the HB Desalination Plant would further reduce the system pressure compared with the design pressure of the discharge system.

While the average annual flow during stand-alone operation of the HB Desalination Plant is expected to be approximately 106.7 MGD for the intake and 56.7 MGD directed out of the discharge, the engineering study of back-pressure with the proposed modifications conducted by Alden (2017b) also considered the proposed diffuser under an operational scenario of 127 MGD through only the three duckbill diffusers (with the center port capped). With the proposed modifications, Alden (2017b) estimated the head loss to be 4.99 feet H_2O, or within the structural design parameters for the existing discharge pipe and within the pressure ranges that the pipe is subject to under current operating conditions. Before the HB Desalination Plant begins operating but after the diffuser is installed (and prior to wedgewire screen installation), both HBGS generating units could be operating with the 4.5 foot center port open. This would produce the same or less back-pressure in the discharge system as the stand-alone scenario of 127 MGD with the port closed.

Introduction of concentrated brine to the discharge pipeline may also increase the rate of salt and related deterioration mechanisms in the concrete such as chloride-induced rebar corrosion and salt scaling. Since the outfall is submerged and not subjected to wet/dry conditions, the effects would not be as pronounced as when compared to similar salinity exposure in tidal (wet/dry) areas. In addition, the discharge pipeline was designed for service in seawater, which would have included provisions to mitigate chloride-induced rebar corrosion. Recent assessment of the existing Encina Power Station outfall in Carlsbad, which was built at a similar time to the HBGS and which operates in a similar environment, has shown these concrete pipelines to exhibit higher durability than similarly-designed structures that were built slightly later (GHD 2017b).

Poseidon has proposed a lease condition to address issues raised, both in the 2010 FSEIR and during public scoping for the Lease Modification Project, about the structural

integrity of the discharge pipeline when operating with a diffuser or with concentrated brine flowing through it (compared to existing conditions). Pursuant to APLC-1, a California registered structural or civil engineer would conduct a Pipeline Integrity Assessment Inspection prior to installation of the diffuser to determine the outfall's structural integrity (see full text in Table 4-02 in Section 4, *Environmental Setting and Impact Analysis*). The Report, which would be submitted for approval by CSLC engineering staff, would be used as a basis to estimate the remaining service life of the existing pipeline with the diffuser installed and increased salinity in the discharge system, and shall include information on:

- Past and current inspections by the owner and operator of the outfall pipe
- The competence of the outfall pipe and its anchoring system for on-bottom stability from bottom currents and expected wave loading
- The outfall pipe's continuing ability to support the selected diffuser design, based on identified industry standards

Thereafter, periodic inspections would be conducted by Poseidon based on a schedule determined by CSLC engineering staff.

2.4.4.2 Diffuser Discharge Velocities

The outfall diffuser, to be placed prior to co-located or stand-alone operations, would be modified by permanently sealing (capping) the central 54-inch discharge port. The three duckbill valves could accommodate HB Desalination Plant co-located and stand-alone discharges of approximately 77 MGD and 56.7 MGD, respectively. With only these valves open during co-located or stand-alone operation of the HB Desalination Plant, the initial discharge velocity would be 11.9 or 10.1 ft/s, respectively (see Table 2-5) (Alden 2017a). The intent of this design is that the brine discharges would not interact with the sea floor until the plume velocities are reduced.

Table 2-5. Initial Diffuser Discharge Velocities (Various Operating Scenarios)

Operating Scenario	Design Conditions				
	Flow		Velocity	Valve # & Port Status	Diffuser Pipe Description
	MGD	cfs	ft/sec		
Long-term stand-alone desalination	56	87	10.1	3 & port closed	36" valves
HBGS 1 unit and desalination	77	119	11.9	3 & port closed	36" valves
HBGS 1 unit – no desalination / brine discharge	127	196	15.1	3 & port closed	36" valves
HBGS 2 units – no desalination / brine discharge	254	393	15.4	3 & port open	36" valves & ~~56~~54" (4.5') port

Source: Alden 2017a
Notes: ' = feet; " = inches; cfs = cubic feet per second; MGD = million gallons per day.

2.4.5 Construction of Intake and Outfall Facilities

Installation of the wedgewire screens and diffusers requires transportation of barges, equipment and crew to the site, anchoring, dredging, riprap reconfiguration, and pile driving. Impacts associated with these issues are addressed in Section 4.1, *Ocean Water Quality and Marine Biological Resources*. Vessel traffic is also addressed in Section 4.10, *Transportation (Marine)*.

2.4.5.1 Construction Vessels

Construction of the screens and diffuser, and placement of the diffuser cap if needed, would entail one tug boat trip to deliver the crane barge from the Port of Long Beach (POLB) and one to remove it from the site, for each activity. Poseidon proposes to use crew and supply vessels from the POLB or closer harbors (e.g., Newport Harbor, Los Alamitos). Boats would shuttle workers between the port and work site daily, and additional trips may be needed to deliver equipment and supplies.

2.4.5.2 Anchoring, Dredging, Riprap Reconfiguration, and Pile Driving

<u>Anchoring</u>

Anchoring is required to ensure that construction barges remain stationary. Poseidon has committed to developing an Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map (Anchoring Plan), as an APM. The Anchoring Plan will identify and map all areas of kelp, seagrasses, and hard substrate found within the work area, which shall not be impacted by anchors, dragging anchor or buoy lines or cables, riprap, or dredging spoils during Lease Modification Project construction and maintenance.

<u>Dredging/Trenching</u>

Installation of the wedgewire screens requires dredging and trench construction (for the intake pipeline ~~concrete~~ header). Details of this step are presented below.

- Approximately 1,000 to as much as 3,300 cubic yards of soils would be excavated, depending on the final design phase geotechnical confirmation for the wedgewire screen installation. Any soils in excess would be either placed on a support barge and then offloaded at the POLB for disposal in an appropriate land-based facility, or disposed in the ocean if permitted.

<u>Riprap Reconfiguration</u>

Installation of the wedgewire screen and diffuser will require moving and reconfiguring the existing riprap around the intake and discharge pipeline towers. The riprap that currently surrounds both the intake and discharge pipeline towers would first be side-

cast, with the sidecast riprap replaced after installation. Final reconfiguration would result in an increase in the benthic footprint (see Figures 2-7b and 2-8b).

- At the intake tower site, the size and shape of the footprint (tower and protective riprap) would be extended by 608 square feet, including approximately 1,319 square feet outside the existing intake facility footprint.
- At the discharge tower site, the size and shape of the footprint (tower and protective riprap) would be extended by approximately 4,000 square feet.

Poseidon will implement a Turbidity Minimization and Monitoring Plan, as an APM, to address turbidity that would be generated during dredging and riprap reconfiguration.

Pile Driving

Poseidon also proposes to conduct pile driving to install pile foundations for the ~~concrete~~ header that would support the wedgewire screens. Eight to ten 12-inch steel H-piles would be installed using impact or vibratory pile driving, which would last about 3 days. Impact pile driving includes a piston system with weights that are usually raised by a power source (e.g., ignition, hydraulic, steam) then dropped onto the pile in order to drive it into the substrate (California Department of Transportation [Caltrans] 2015). For vibratory pile driving, a vibrator case is attached to the pile and vibrations are then transferred from the case to the pile using hydraulic, electric, or pneumatic power packs (Warrington 1992; Stuedlein and Meskele 2013) that cause liquefaction and allow the pile to sink downward into the sediment (for this reason, vibratory pile driving is suitable only where soft substrates are present).

2.4.5.3 Installation of the Diffuser

The diffuser would be installed prior to, or concurrently with, the wedgewire screens. The diffuser system would be installed from an anchored derrick barge with a barge-mounted crane, moored above the tower during construction. Offshore work would be confined to the area directly above the existing discharge tower (Dudek 2016a). Construction would take 1 to 2 months with work hours limited to between 7 a.m. and 6 p.m. to adhere to City Municipal Code. Public access to the offshore work area (about 1,500 feet offshore) would be prohibited during installation of the diffuser.

Personnel access would be provided on a daily basis by an approximately 77-foot-long utility boat. Onshore support vehicles at the selected port may include pick-up trucks, forklift, crane, and wheel loader. Construction crews and vessels would vary depending on the scope of work occurring each day.

- A day with lower activity levels would likely require approximately 13 crew members: 10 for the utility boat and three for a smaller (approximately 20 feet long) monitoring boat for marine mammal and turbidity monitoring.

- A day with higher activity levels may require as many as 23 crew members: 16 for a derrick barge; four for a tug boat; and three for the monitoring boat.

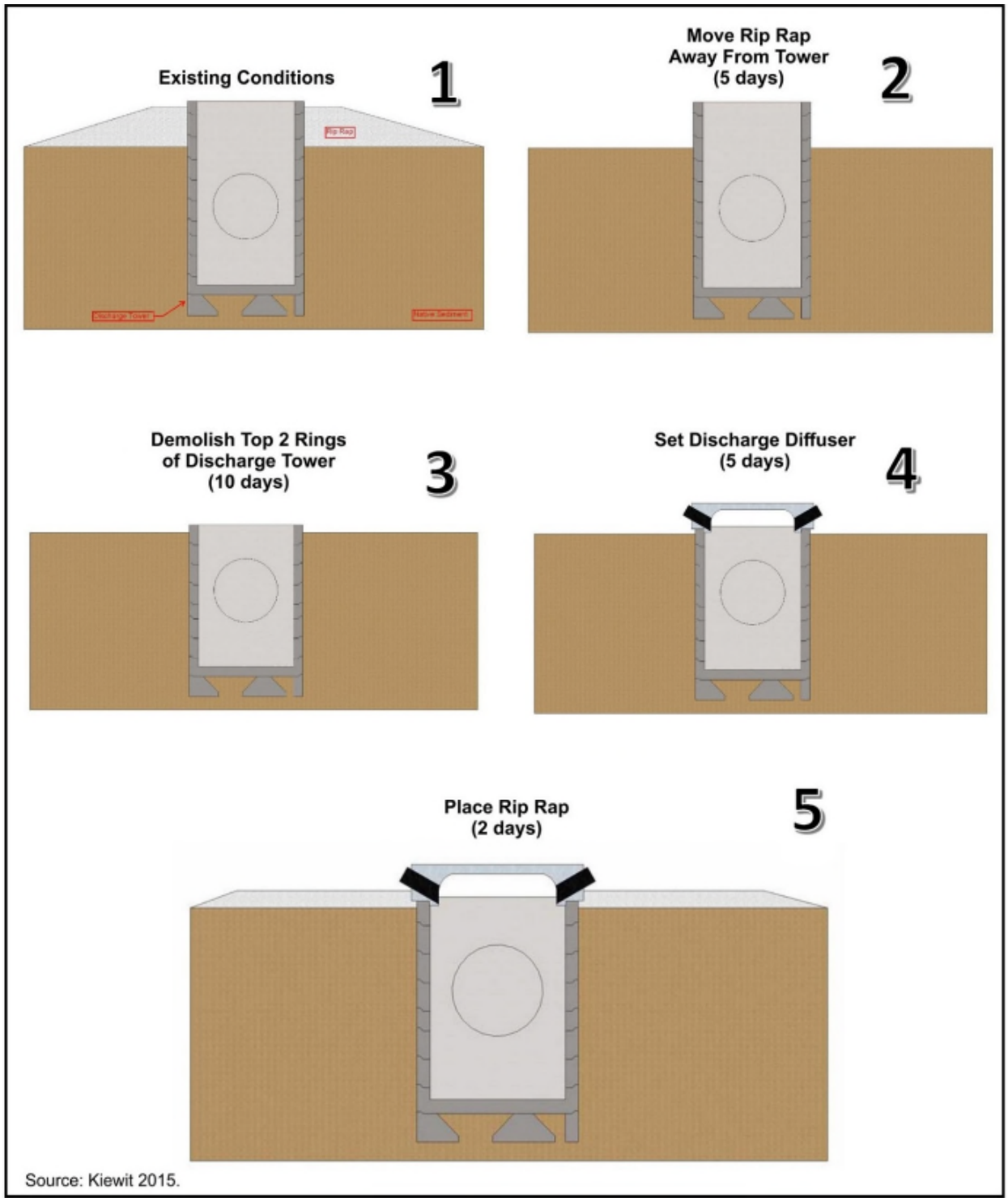
Installation of the diffuser may occur before, or concurrently with, screen installation. In either case, a similar set of vessels and crew will be required for each installation.

A five-step process will be used to install the diffuser (see also Figure 2-9).

1. The first illustration in Figure 2-9 shows the existing cross-section view of the discharge tower, with riprap around the discharge tower.
2. Existing riprap surrounding the existing tower would be moved to the side (side-cast) of the tower. The top of the existing tower would be demolished, so the tower height with the diffuser in place would be approximately the same as it is now with the existing open discharge.
3. The diffuser would be constructed off-site, transported to the POLB, loaded on a support barge, and transported to the site.
4. The precast diffuser cap would be installed on top of the modified (shortened) tower. (Casting the cap with its imbedded pipes for the duck-bill check valves onshore allows for the installation of a single structural unit to be installed offshore [Alden 2017a]).
5. The riprap would be replaced around the new diffuser so it is about 10 feet thick at the pipe, thinning with distance, and enlarging the existing riprap footprint by about 4,000 square feet.

When the HBGS decommissions one of its two generating units (starting operation with only one unit requiring 127 MGD for cooling), a cap (a concrete block) would be installed to close the 54-inch port. After this point, discharge from the desalination plant would occur only through the three 36-inch duckbill valves for both co-located and stand-alone operation (no brine would be discharged with the port open). This cap would be installed in one day (Alden 2017a). The installation of the cap would require a derrick barge and a dive crew. The diver would first clean the mating surface, and then guide the concrete block into position. Once the block is in place, it would not be removed.

Figure 2-9. Diffuser Installation Process

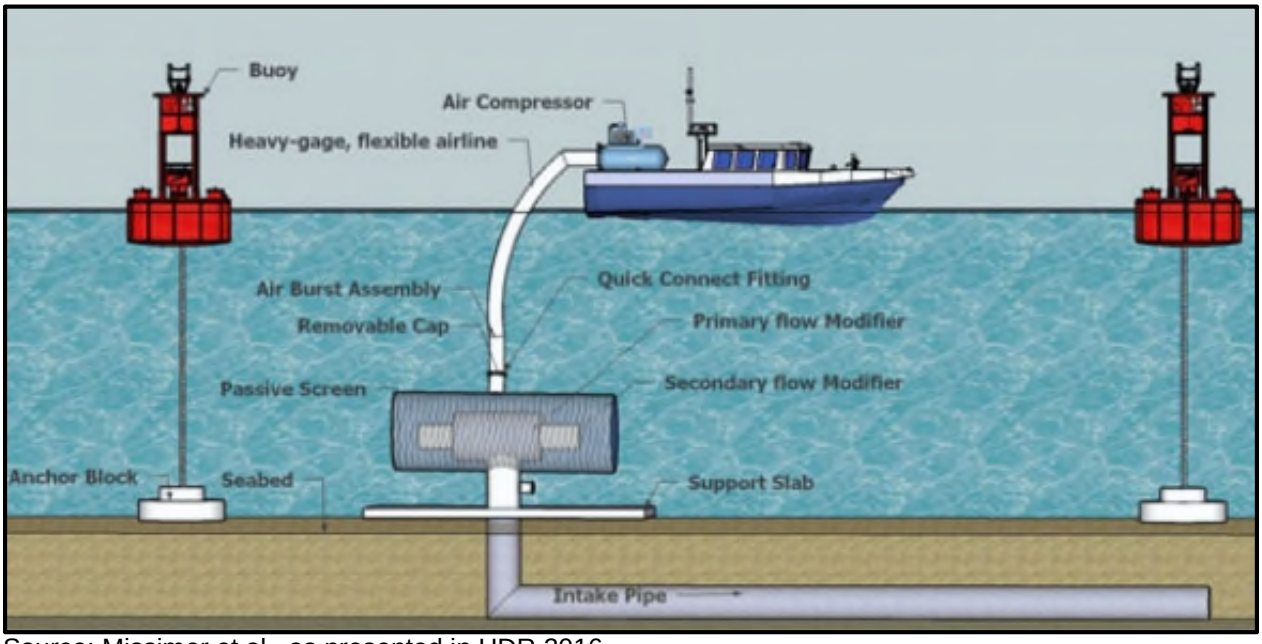


2.4.5.4 Wedgewire Screen Installation

Construction and installation of the wedgewire screen manifold and associated infrastructure would take approximately 3 months. Work would be conducted from a derrick barge moored above the tower and would be confined to the area directly surrounding the tower. The wedgewire screens would be fabricated at an off-site location, transported to the POLB, loaded onto a support barge, and taken to the installation site (Dudek 2016a). Onshore support vehicles at the POLB may include pick-up trucks, forklift, crane, and wheel loader. Construction crews and vessels would vary depending on the scope of work occurring each day. The number of crew members present would be the same as that described in Section 2.4.5.3, *Installation of the Diffuser*, unless installation of the diffuser occurs concurrently with the installation of the wedgewire screens. In that case, a set of vessels and crew would work at each site.

In addition, two gravity anchor blocks would be installed, to be used ~~if Poseidon implements~~ for a boat-based air burst screen cleaning system for screen maintenance (see Section 2.4.6.2, *Screen Maintenance*, and Figure 2-10 (below). The gravity anchors would be installed during construction of the wedgewire intake system using the same vessels and crew as has been proposed for the wedgewire screen installation.

Figure 2-10. Boat-Based Air Burst System for Offshore Wedgewire Screens

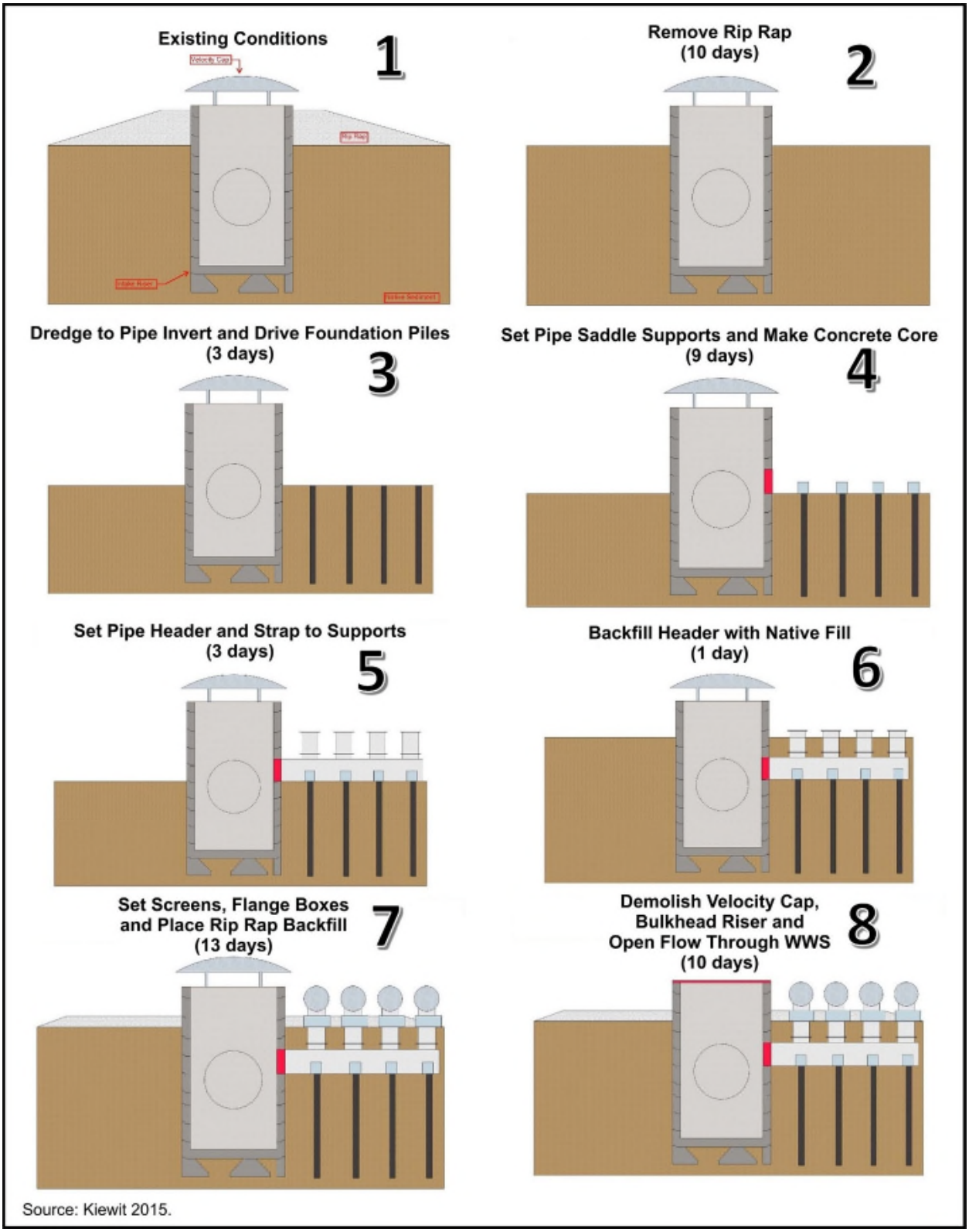


Source: Missimer et al., as presented in HDR 2016.

An eight-step process will be used to install a screen (see also Figure 2-11).

1. The existing velocity cap and riprap are shown in cross-section.
2. The riprap would be moved away from the existing intake header (requiring about 10 days).
3. Dredging would occur to the level of the header invert (10 days dredging), and pile foundations would be driven for the screens (requiring about 3 days for the pile driving). Approximately 1,000 to as much as 3,300 cubic yards of soils would be excavated, depending on the final design phase geotechnical confirmation, and side-cast near the construction area, where they would have highly similar sediment composition to those in the side-cast footprint. Suspended sediments excavated would likely be redistributed by ocean currents. If excess material cannot be re-used or relocated on the ocean floor, it will be loaded on support barges and taken to the POLB for disposal in an appropriate land-based facility.
4. Supports for the pipe saddle (the supporting concrete foundation upon which the screens would be installed) would be set on top of pile foundations, and a single concrete core would be made in the side of the existing intake tower. The coring of the existing intake tower would be performed using divers and diamond saws. After coring small holes into the existing intake tower, diamond saw/cable would be used to cut the concrete between the holes. The concrete that was cut out would be raised to the surface and placed on the barge for land disposal. Saddle supports for the manifold of the wedgewire screens would be made of pre-cast concrete and set into position by the barge. Small rip rap would be placed around the concrete saddles to protect against erosion. (9 days)
5. The pipe header (the single pipe through which all intake seawater would flow, after passing through the screens) would be set on top of the pipe saddle supports, and the header would be strapped to saddle supports. (3 days)
6. Native soil would be backfilled around pipe header. (8 days)
7. The four wedgewire screens would be set on top of each pipe header (13 days). Riprap backfill would be replaced from sidecast riprap.
8. The existing velocity cap would be demolished and a bulkhead would be installed on the intake tower to close off the previously open-ocean intake. No explosives would be used. Demolition would be done by divers who, using rivet guns and concrete core saws, would cut and break up the concrete into manageable sized pieces. Air compressors on deck and a crane on the derrick barge would be used to lift the demolished material from the velocity cap. (10 days).

Figure 2-11. Installation of Wedgewire Screens



Source: Kiewit 2015.

2.4.6 Operations and Maintenance

2.4.6.1 Screen and Diffuser Operations

Operation of the intake screens and discharge diffuser would require no external moving parts and no dedicated personnel to operate these components. Biofouling organisms will colonize the walls of the intake as they have done, but the ability of these organisms to grow to such an extent as to block sufficient flow and impact the safe operation of the desalination plant is unlikely (HDR 2017). Chlorination and de-chlorination will be added to the intake source water after the intake pump station to protect the filter process and will not be added to the offshore intake pipeline.

2.4.6.2 Screen Maintenance

The HB Desalination Plant site poses two major challenges in regards to maintenance of the wedgewire screens (SWRCB 2015a):

- seawater salinity – the material must be corrosion and biofouling resistant
- distance offshore – methods to clean debris or fouling organisms from the screen faces must work approximately 1,650 feet offshore in about 35-foot water depth

Poseidon would inspect screens ~~at least quarterly~~ every other month to confirm their condition and ensure proper operation using a four-person dive crew (two divers and two boat-based crew members). Manual cleaning would be performed during these dives as needed. ~~Depending on the wedgewire screen technology used, t~~The screen array for the HB Desalination Plant could be feasibly cleaned manually by divers ~~or~~ and by air bursting (see Table 2-6)~~. The frequency of cleaning would depend on the technology chosen. For all screen cleaning options~~, and the following initial assessment would be completed.

- After start-up and for the first few months of operation, inspection dives would be conducted at 2-week intervals (i.e., twice per month) to collect baseline data on the rate of biofouling and to refine the screen inspection/cleaning frequency.
- Depending on the observed biofouling rate, inspection/cleaning dives would be conducted at a reduced frequency after the first few months. This is anticipated to be ~~quarterly~~ every other month (i.e., ~~four~~ six dives per year).
- If fouling rates are higher than anticipated, or are shown to increase seasonally, the inspection/cleaning frequency may increase or be refined accordingly.

2.4.6.3 Diffuser Maintenance

The diffuser is not anticipated to require substantial maintenance. Poseidon would inspect the duckbill nozzles in quarterly dive visits. During diffuser inspection, the divers would manually scrape the external diffuser surfaces with hand tools, as necessary. Biofouling debris would be passively swept from the discharge station.

Table 2-6. Wedgewire Screen Cleaning ~~Options~~ Methods

~~Option 1:~~ Manual Cleaning by Divers	~~Option 1 consists of using~~ This method uses divers working on a regular schedule to keep the screens clean. The divers would physically scrape and/or pressure wash the screen faces, most likely occurring during a regularly-scheduled inspection. While it is possible to design a wedgewire screen array in which individual screens could be removed, a clean-in-place (CIP) method would likely be implemented due to simplicity (i.e., a diver would be required regardless of whether screens are removed for cleaning or by CIP). Manual cleaning would require a minimum of two divers in the water and two crew members on the service boat stationed over the intake site. A service boat would be temporarily anchored over the offshore intake location. The divers would deploy over the offshore intake location and remain connected by a cord (with a video feed) to the service boat. One boat-based crew member would monitor the divers via video and the other crew member would be responsible for the boat. The divers would manually scrape the external screen surfaces with hand tools and the liberated biofouling debris would be passively swept from the offshore intake location. When the divers return to the service boat, the anchor would be weighed and the service boat would depart from the offshore intake location.
~~Option 2:~~ Onshore Air Burst System	~~Option 2 consists of the~~ This method would install~~ation~~ and operate ~~ion, if feasible, of~~ an onshore-based air burst system to keep the offshore wedgewire screens free of debris. These compressed air systems include a compressor, an accumulator (also known as a receiver), controls, a distributor, and air piping that directs a burst of air from within each screen. The burst of high pressure air dislodges impinged debris which can then be swept away from the screen by ambient currents. The air burst equipment is typically installed onshore and a small diameter pipe is used to deliver the high pressure air to the screens offshore. Air bursting is typically limited to shoreline and nearshore screen installations and~~ due to the distance of the proposed screens from shore (1,650 feet) it~~ is not considered by Poseidon for the proposed Lease Modification Project ~~a primary alternative at this time~~.
~~Option 3:~~ Boat-Based Air Burst System **(see Figure 2-10)**	A boat-based air burst system would use an onboard compressor and flexible air hosing. The boat would be periodically moored above the offshore intake location, and the wedgewire screens would be fitted with flanges to allow temporary connection of the hose. Divers would air burst screens individually and in sequence by moving the air hose from one screen to the next. Poseidon ~~does not~~ anticipate<u>s</u> implementing this process as a maintenance approach for keeping the screens clean. ~~However, if biofouling becomes a maintenance issue and Poseidon later chooses to implement a boat-based air burst system~~ Therefore, gravity anchor blocks (see Figure 2-10) would be placed on the ocean floor to keep the boat on station during the air burst process. Ensuring that the service boat can remain on-station would be important because this would allow the divers to properly connect the compressed air hose to each screen. The gravity anchors would be installed during construction of the wedgewire intake system~~. However~~, ~~the~~and surface buoys would ~~only~~ be deployed ~~if the decision is made to implement~~ when the system begins operating (if and when manual diver cleaning is deemed to be ineffective).

2.5 APPLICANT PROPOSED MEASURES

Poseidon has committed to implement the APLC and APMs listed in Table 2-7. The full text of each measure is included in Table 4-02 in Section 4, *Environmental Setting and Impact Analysis*, with a discussion of its implementation under the applicable environmental issue (impact) area (e.g., Section 4.1, *Ocean Water Quality and Marine Biological Resources*). For implementation tracking purposes, the APMs are included in Section 7, *Mitigation Monitoring Program*.

Table 2-7. Applicant Proposed Measure/Lease Condition Summary

Applicant Proposed Measure (APM)/ Applicant Proposed Lease Condition (APLC)	Potential Impact Area
APLC-1. Pipeline Integrity Assessment Inspection and Report	Intended to address issues raised, in the 2010 FSEIR and during public scoping, about the structural integrity of the discharge pipeline when operating with a diffuser or with concentrated brine flowing through it (compared to existing conditions).
APM-1. Offshore Construction Best Management Practices (BMPs) to Protect Water Quality	Ocean Water Quality and Marine Biological Resources (Section 4.1)
APM-2. Turbidity Minimization and Monitoring Plan	Ocean Water Quality and Marine Biological Resources (Section 4.1)
APM-3. Spill Prevention and Response Plan	Ocean Water Quality and Marine Biological Resources (Section 4.1) Hazards and Hazardous Material (Section 4.7)
APM-4. Workers Educational Training	Ocean Water Quality and Marine Biological Resources (Section 4.1)
APM-5. Sensitive Marine Species Monitoring Plan and Offshore Construction BMPs to Protect Marine Biological Resources	Ocean Water Quality and Marine Biological Resources (Section 4.1)
APM-6. Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map	Ocean Water Quality and Marine Biological Resources (Section 4.1) Cultural Resources (Section 4.4)
APM-7. Energy Minimization and Greenhouse Gas (GHG) Reduction Plan	Greenhouse Gas Emissions (Section 4.6)
APM-8. Composition and Maintenance of Wedgewire Screens	Ocean Water Quality and Marine Biological Resources (Section 4.1)

3.0 CUMULATIVE PROJECTS

This section provides a listing and map identifying other related future projects near the location of the proposed Poseidon Resources (Surfside) LLC (Poseidon or Applicant) *Seawater Desalination Project at Huntington Beach: Outfall/Intake Modifications & General Lease — Industrial Use (PRC 1980.1) Amendment* (Lease Modification Project). State California Environmental Quality Act (CEQA) Guidelines section 15130 requires that an Environmental Impact Report (EIR) discuss cumulative impacts of a project when the project's incremental effect may be cumulatively considerable (as defined in State CEQA Guidelines, § 15065, subd. (a)(3)). An EIR, however, should not discuss impacts which do not result in part from the project evaluated in the EIR. Where a CEQA agency is examining a project with an incremental effect that is not "cumulatively considerable," the agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. As defined in State CEQA Guidelines section 15355:

> *"Cumulative impacts" refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. (a) The individual effects may be changes resulting from a single project or a number of separate projects. (b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.*

The cumulative projects study area for this Supplemental EIR includes projects located in the immediate onshore, nearshore, and offshore areas of the Huntington Beach coast. The project list for the cumulative impacts analysis includes projects that are either reasonably foreseeable or are expected to be constructed or operated during the Lease Modification Project life. This list includes development projects that are in the planning stages, adopted, under construction, and constructed. As illustrated in Figure 3-1, the geographic area considered also includes the 50 million gallon per day Huntington Beach Desalination Plant (HB Desalination Plant) and its associated distribution pipeline system (see Section 1.2.5, *City of Huntington Beach and Orange County Water District*, for status). The study area also includes the offshore area between the Port of Long Beach (POLB) and Huntington Beach where marine vessel traffic would occur. For example, as discussed in Section 4.10, *Transportation (Marine)*, offshore construction on the Huntington Beach Generating Station (HBGS) pipelines would require tug boats to deliver and remove a crane barge, daily boat trips to shuttle workers between the POLB and work site, and potential additional trips to deliver equipment and supplies. These trips would occur at the same time as other existing vessel traffic. Figure 3-2 shows other current and proposed desalination facilities.

Figure 3-1. Map of Cumulative Projects

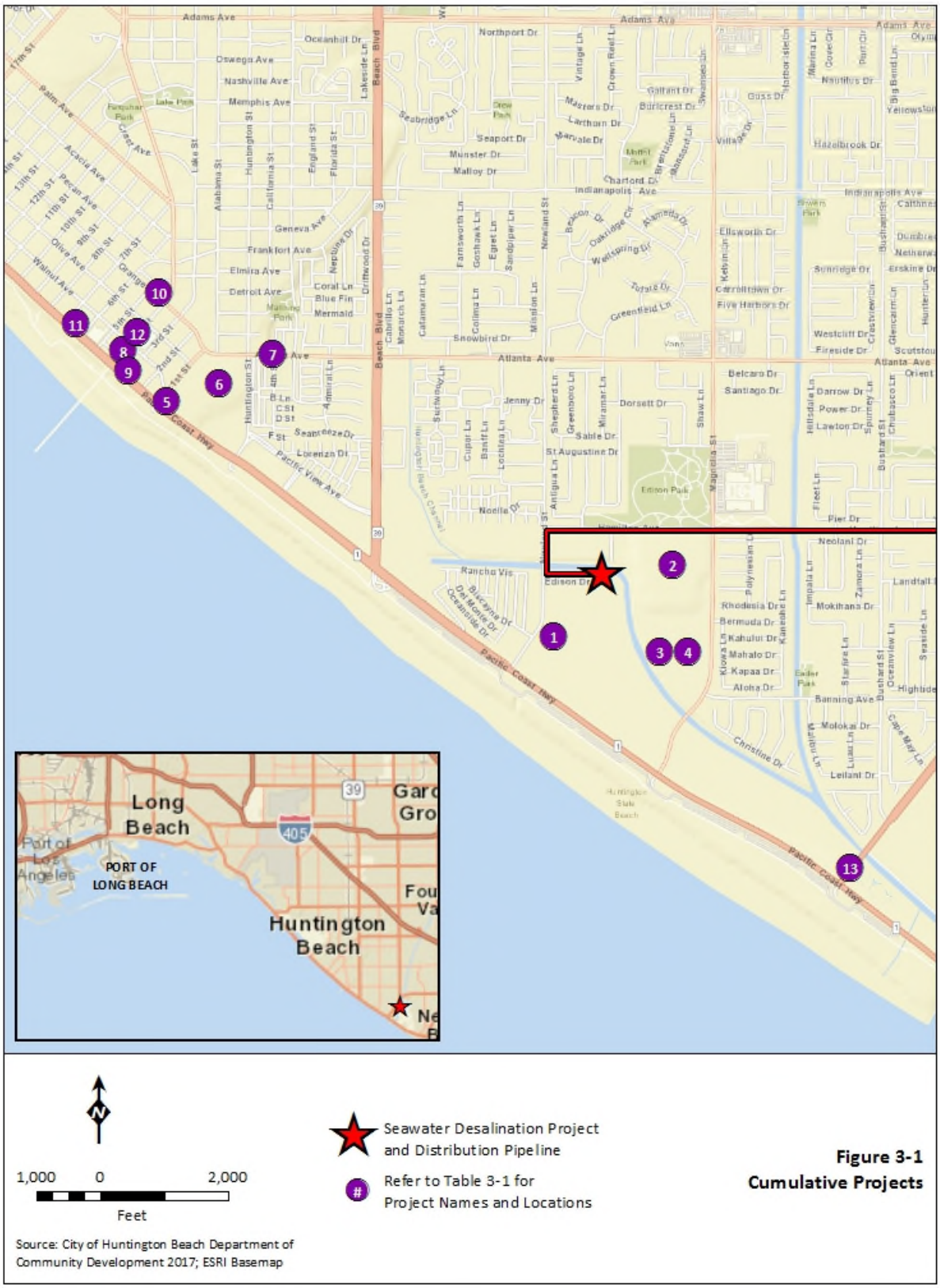
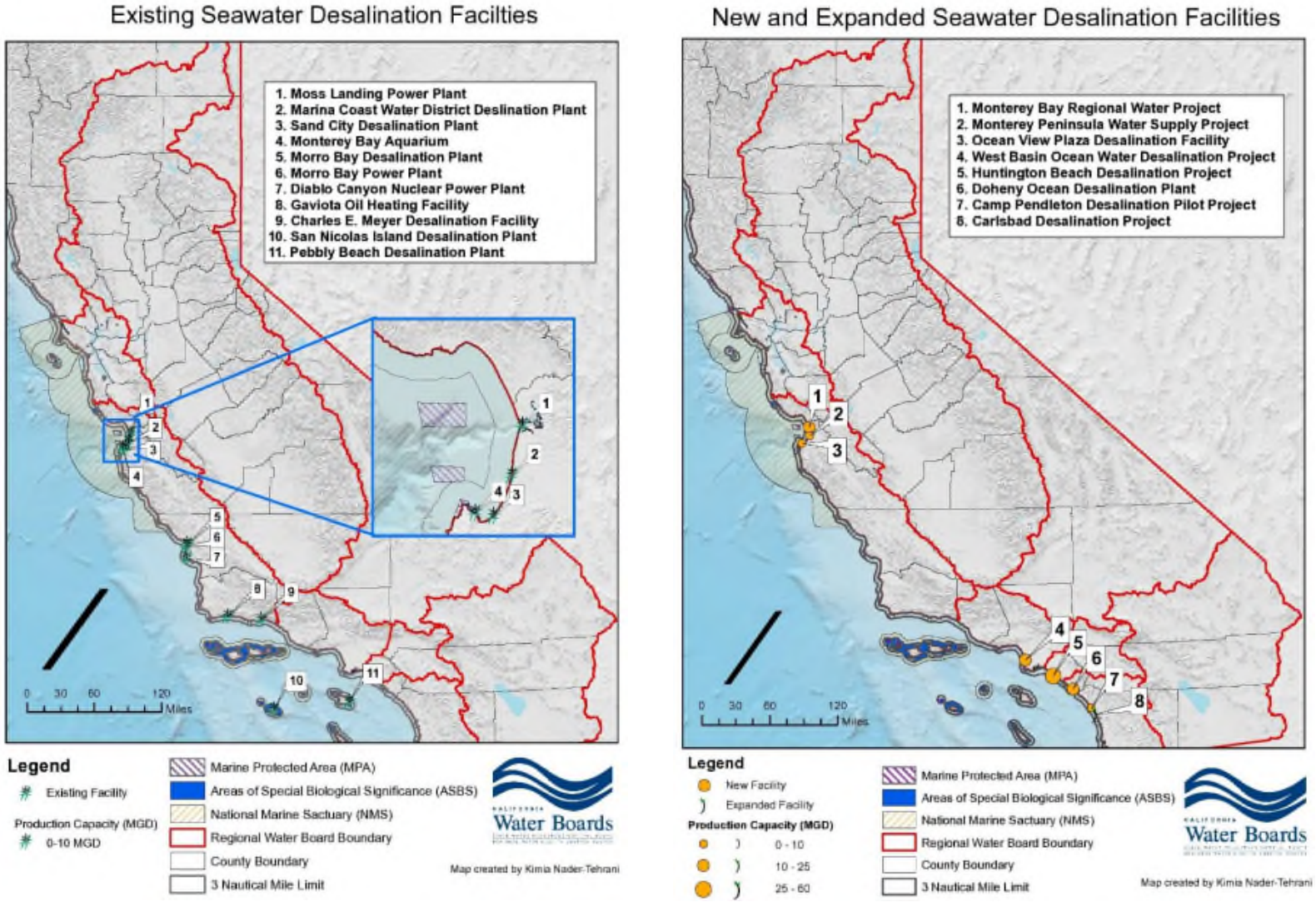


Figure 3-2. California Seawater Desalination Facilities



Source: State Water Resources Control Board 2017b.

As discussed in Section 1, *Introduction*, of this Supplemental EIR, direct and cumulative impacts associated with HB Desalination Plant construction and operation were analyzed in 2010 in a Final Subsequent Environmental Impact Report (2010 FSEIR) certified by the city of Huntington Beach (City). However, offshore construction activities were not part of the 2010 Project subsequently approved by the City and California State Lands Commission (CSLC).

3.1 METHODOLOGY

The geographic area where cumulative effects can occur varies by resource or issue. For example, air quality impacts tend to disperse over a large area, while noise impacts are typically more localized. For this reason, the appropriate geographic scope for the analysis of cumulative impacts must be identified for each issue area. Information was collected on other projects in the Lease Modification Project vicinity, since the impacts of nearby projects could combine with similar impacts of the Lease Modification Project and thus contribute to cumulative impacts. The cumulative project list includes projects that are either proposed, recently approved, or under construction within the city of Huntington Beach. The information on each project was provided by the Huntington Beach Department of Community Development or gathered from publicly available sources. The information was current as of November 2016 (when the Notice of Preparation was issued).

The analysis of cumulative effects considers several variables, including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. The geographic scope of each analysis is based on the topography surrounding the Lease Modification Project (in this case ocean waters less than 0.5 mile from shore) and the natural boundaries of the resource affected, rather than jurisdictional boundaries. The geographic scope of cumulative effects will often extend beyond the scope of the direct project effects, but not beyond the scope of the indirect effects. The geographic scope of cumulative effects may be broader than that illustrated in Figure 3-1 for certain environmental disciplines where impacts could combine in broad areas (e.g., air quality and marine biological resources; this is described in each section's analysis). In addition, each project has its own implementation schedule, which may or may not coincide or overlap with the Lease Modification Project schedule.

Cumulative impacts evaluated in this Supplemental EIR would likely represent a "worst-case" scenario for the following reasons.

- Not all of the cumulative projects will be approved and built, and construction of some projects will not coincide with Lease Modification Project activities.
- Other projects would likely be, or have been, subject to unspecified mitigation measures that would reduce their impacts and thereby reduce the potential for contributing to cumulative impacts.

The cumulative impact analysis is only able to consider future projects that are reasonably foreseeable, meaning future projects that were either proposed or approved at the time the Supplemental EIR analysis was initiated. Future projects that are not foreseeable at this time would likely generate impacts similar to those of the projects in the cumulative projects list generated for this Supplemental EIR (see Table 3-1 at the end of this section).

3.1.1 Lease Modification Project Geographic Limits

Proposed Lease Modification Project activities and locations, as described in Supplemental EIR Section 2, *Project Description*, can be summarized as follows.

Stage	Project component	Location
Construction	Wedgewire Screen Installation	Approximately 1,650 feet offshore, directly above existing subsea intake pipeline tower
	Diffuser Installation	Approximately 1,500 feet offshore, directly above existing subsea discharge pipeline tower
	Both	• Work conducted from an anchored derrick barge with a barge-mounted crane • Components fabricated at an off-site location, transported to the Port of Long Beach, loaded onto a support barge, and taken by barge to the installation site
Operation	Wedgewire Screen Maintenance	Approximately 1,650 feet offshore, directly above existing subsea intake pipeline tower • One boat would anchor to the installed gravity anchors near the wedgewire screen manifold • Divers would use boat-based system to connect compressed air hose to each screen and air burst biofouling material
	Diffuser Maintenance	Approximately 1,500 feet offshore, directly above existing subsea discharge pipeline tower and at the gravity anchors • One boat would anchor to the installed gravity anchors near the outfall • Divers manually scrape for biofouling, as needed, during inspection trips

3.1.2 Lease Modification Project Timing

Activities associated with the Lease Modification Project and their frequency and duration, as described in Supplemental EIR Section 2, *Project Description*, can be summarized as follows.

Stage	Project component	Timing
Construction	Wedgewire Screen Installation	• Approximately 3-month construction period • Construction period would occur after or at same time as diffuser installation
	Diffuser Installation	• Approximately 2-month construction period • Construction period would occur before or at same time as diffuser installation
	Both	• Maximum 5-month or 3-month construction period (depending on if separate or concurrent offshore construction) • Work hours limited to between 7 a.m. and 6 p.m. • Construction periods could overlap with land-based construction of HB Desalination Plant and offsite distribution system pipeline/pump stations
Operation	Wedgewire Screen Maintenance	• Every other month (six times per year) for one day; two trips may potentially coincide with diffuser inspection trips.
	Diffuser Maintenance	• Quarterly (four times per year) for one day, during diffuser inspection trips

3.1.3 Assessment of Closely Related Project Impacts

To assess if impacts of the proposed Lease Modification Project, when considered together with the impacts of closely related projects, are cumulatively considerable, this Supplemental EIR takes into account all of the following circumstances.

- The environmental resource affected (e.g., air quality, water quality, etc.)
- How close in distance the projects are and where an impact might occur (e.g., offshore, onshore, both)
- The short-term, temporary nature of the proposed Lease Modification Project's construction impacts
- The long-term magnitude of Lease Modification Project's operational impacts

3.2 CUMULATIVE PROJECT LIST

Several coastal, industrial, or transportation projects in the vicinity of the Lease Modification Project may contribute to cumulative impacts. Adjacent projects that could affect the same resources as the Lease Modification Project are listed in Table 3-1 and summarized below. Figure 3-1 above is numbered in accordance with Table 3-1. Three projects that would occur very near the HB Desalination Plant – demolition of the HBGS and replacement with the Huntington Beach Energy Project (HB Energy Project), the Ascon Landfill, and the Magnolia Oil Storage Tank Redevelopment Project – are

discussed in more detail below, along with a brief discussion of the potable water distribution pipeline associated with the HB Desalination Plant.

3.2.1 HBGS Demolition and Replacement with the HB Energy Project

On June 27, 2012 AES Southland, LLC (AES) submitted an Application for Certification (AFC) to the California Energy Commission (CEC) seeking permission to construct and operate a new power generation facility, the HB Energy Project. The HB Energy Project is located onshore entirely within the footprint of the existing HBGS, an operating power plant that has been in operation since the late 1950s. The HBGS would be decommissioned and demolished in phases as the HB Energy Project is built (CEC 2016). The HB Energy Project was proposed as a natural-gas fired, combined-cycle, air-cooled, 939-megawatt (MW) electrical generating facility that would replace the AES HBGS. The HB Energy Project would have two independently operating, combined-cycle gas turbine power blocks. The CEC approved the HB Energy Project as a 939-MW facility in 2014. Construction would occur in two phases. The first phase would consist of a natural gas-fired, combined-cycle, air-cooled, 644-MW electrical generating facility expected to be completed by 2020. After the first phase combined-cycle power block is operational, phase two of construction would begin to add two 100-MW simple-cycle gas turbines. Demolition of the HBGS and construction of the HB Energy Project are anticipated to occur over 9 years and to last through the fourth quarter of 2025 (CEC 2016). Demolition has started onsite (see monthly compliance reports at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=12-AFC-02C).

The HB Desalination Plant would be built on a portion of the HBGS site, and it would use the power plant's existing seawater intake and discharge pipes associated with the offshore Lease Modification Project.

3.2.2 Ascon Landfill Remediation

The Ascon Landfill Site is a 38-acre property located ~~adjacent to~~ onshore near the eastern boundary of the HB Desalination Plant, at the southwest corner of Magnolia Street and Hamilton Avenue in Huntington Beach. It was used as a licensed landfill from the 1930s to the early 1980s. With the oversight of the California Department of Toxic Substances Control (DTSC), the Responsible Parties are preparing for Ascon's remediation. The website for the remediation presents the following history and status (Ascon 2017). In August 2016, Ascon submitted a Coastal Development Permit (CDP) and Conditional Use Permit (CUP) application to the City for local permits necessary to implement the final remedy, as defined in the 2015 EIR. The Final EIR was published in May 2015, and was certified on June 18, 2015. DTSC approved the Final Remedial Action Plan (RAP) on June 19, 2015. The Notice of Determination (NOD) for the EIR and RAP was filed with the State Clearinghouse on June 22, 2015.

The July 2017 Community Update (DTSC 2017) notes that the preliminary phase of remedial work (including Lagoon Solidification with 4,000 tons of concrete and oil well abandonment) was anticipated to begin in July. Solidification is required to support the equipment necessary to abandon two oil wells (Pacific Ranch 1 and 1a) prior to the final remedy field work. These oil wells date back to the 1920s and are beneath material deposited later during the landfill's operational years. This phase will last about 8 months.

Prior to the development of the Final RAP, the Ascon site includes the following history.

- Eight companies entered into orders with the DTSC in early 2003 to participate in and fund remediation of the Site (Responsible Parties). These parties are cooperating with the clean-up planning and funding. No public funds will be used for the remediation of the site. Field investigations at the site were conducted from 2002 through 2014. DTSC approved the Revised Feasibility Study in the third quarter of 2007, and the Draft RAP in August 2013.
- In response to heavy rains received in the 2004-2005 winter, an Emergency Action was conducted at the site in 2005-2006. Additional site housekeeping was conducted to provide for improved storm water management. Interior roadways were improved for the future clean up and for first responder vehicles.
- An Interim Removal Measure (IRM) was conducted in 2010 through early 2011 to remove tarry materials from a few of the lagoons, enabling the assessment of the material under these lagoons. During the IRM work effort, rock and gravel were placed on new roadways and exposed areas to minimize erosion of site soils. DTSC approved the IRM Completion Report in May 2012.
- A 2014 EIR presented the selection of the final remedy for the clean-up, and required by DTSC to be protective of public health and the environment.

3.2.3 Magnolia Oil Tank Projects

The Magnolia Oil Storage Tank and Transfer Facility Demolition and Removal Project is a 29-acre privately-owned property located onshore at the northwest corner of Magnolia Street and Banning Avenue, ~~immediately adjacent to~~ near the HB Desalination Plant to the southeast. It would involve the demolition and removal of three empty, 25,000,000-gallon, 45-foot tall, above ground crude oil storage tanks; approximately 2,342 linear feet of above-ground transfer piping; and ancillary site improvements at a former oil storage and pumping facility that have existed on the site since the early 1970s (Shopoff Realty Investments [Shopoff] 2017). The City has issued permits for the demolition and removal of the tanks. Demolition of the tank farm is underway and is expected to finish in May 2017 (O'Malley 2017). Once the tanks are removed, AES, the owner of the nearby HBGS, would use the property as a staging area for the construction of the new

HB Energy Project. AES would lease the site from Shopoff (the current owner) for a period of 32 months with no terms for renewal of the lease (O'Malley 2017).

The Magnolia Tank Farm Redevelopment Project is proposed on the former tank farm site. Redevelopment of the site would occur after AES's lease has concluded. The developer's website shows that plans for future uses for the site include a 175-room ecologically-themed lodge and hostel; a 40-room guest house for lower cost overnight stays; a 250-unit housing community, including single-family homes and townhouses; natural open space areas; public parks and plazas; pedestrian and bicycle trails; and local resident and visitor specialty retail (Shopoff 2017). A Specific Plan is being prepared to redevelop the tank farm site, and environmental review (an EIR) by the City will be conducted (Shopoff 2017). The entitlement process would proceed while the site is under lease by the AES (O'Malley 2017). While the developer has held public meetings on this project, no application has been filed with the City. Groundbreaking for the Magnolia Tank Farm Redevelopment Project is anticipated to begin the fourth quarter of 2019 and construction of the planned residences and lodge is anticipated to begin in 2020 with a 3-year build out (O'Malley 2017).

3.2.4 Onshore Potable Water Distribution Pipeline

The 2010 FSEIR analyzed the construction and operation of a pipeline system to distribute potable water produced at the HB Desalination Plant. As analyzed, the system would extend east of the map area into the cities of Irvine and Huntington Beach. Construction of a pipeline cannot begin until Poseidon receives all permits to build, operate, and distribute potable water from the Plant, including from the Santa Ana Regional Water Quality Control Board (RWQCB), California Coastal Commission, and local or regional water agencies.

In March 2017, the Orange County Water District (OCWD) staff placed on hold any plans "to begin an extensive environmental analysis related to use of the desalinated water in OCWD's operations and facilities, along with distributing the water to other agencies, prior to the approval of the permits for the HB Desalination Plant." (Letter from Michael R. Markus, OCWD General Manager, to Kurt Berchtold, Santa Ana RWQCB, March 20, 2017 [OCWD 2017b]; see discussion in Section 1.2.5, *City of Huntington Beach and Orange County Water District*). The OCWD recently reiterated that it "has not reached any conclusions or made any decisions regarding how desalinated [water] could be used by the District and distributed to the local water community, so no specific conveyance and utilization option has been formally selected." (Letter from Michael R. Markus, General Manager, to The Honorable Gavin Newsom, State Lands Commission, September 8, 2017 [OCWD 2017c].) Therefore, any potential future development or modification of the distribution pipeline system analyzed in the 2010 FSEIR is speculative at this time, and not considered as a cumulative project in this cumulative impact analysis.

Also speculative at this time and not considered as a cumulative project in this cumulative impact analysis is the construction of an onshore system to distribute and inject desalinated water from the HB Desalination Plant into the OCWD/Orange County Sanitation District's Groundwater Replenishment System, should OCWD decide to use desalinated water for this purpose. The Groundwater Replenishment System, which has been operational since January 2008, is a state-of-the-art water purification project that can produce up to 100 million gallons of high-quality water every day, or enough to meet the needs of nearly 850,000 residents in north and central Orange County (see https://www.ocwd.com/gwrs/about-gwrs/ [OCWD 2017c]).

3.2.5 Other Projects Using Barges from the Port of Long Beach

Projects planned for area Ports (Long Beach and Los Angeles) could cause an increase in marine traffic that could affect the Lease Modification Project area. These projects may involve increased capacity of the ports and subsequent increases in shipping. Examples are listed below.

3.2.5.1 Port of Los Angeles

Berth Improvement Projects: Multiple berths undergoing planned improvement projects, including optimization of operations and regulatory compliance, some of which could produce increases in shipping.

3.2.5.2 Port of Long Beach

Middle Harbor Redevelopment Project: A modernization project within the Port of Long Beach to combine two shipping terminals into one state-of-the-art container terminal. The program is adding on-dock rail capacity, shore power hookups and a new longer wharf to move twice the cargo with half the air pollution. The first phase of the $1.3 billion project was started in March 2016. This project is scheduled for completion in 2019.

Pier G modernization: A multi-year renovation of the International Transportation Service (ITS) container terminal. The Port has added a new terminal Administration and Operations Complex, new Maintenance and Repair Facility and a new West Arrivals. A new on-dock rail yard has also been completed, nearly doubling the terminal's capacity for on-dock rail.

Becker and Legacy Wells Abandonment and Remediation Project: Remediation of legacy oil wells in Santa Barbara County would involve use of POLB facilities to mobilize a jack-up barge for transport by water northward. No cumulative impacts would be associated with the Becker Well Abandonment and Remediation Project, which would be conducted at Summerland Beach in Santa Barbara County and is scheduled to be completed in Fall 2017.

San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 Decommissioning: Proposed decommissioning of the SONGS intake and outfall pipelines would involve use of POLB facilities for mobilizing offshore construction barges and equipment and transportation to the south. Proposed offshore work in northern San Diego County may begin as early as 2020 so operations may overlap with Poseidon's schedule. However, as discussed in Section 4.10, Transportation (Marine), MM TRM-1 would require the issuance of a Local Notice to Mariners to advise other ships in the area of the location of moored vessels; likely transit routes; the number, location, and duration of divers in the water; and approximate dates, durations, and working hours. All vessels would meet minimum requirements for navigation safety (for example crewing and navigation systems) as stipulated by 46 Code of Federal Regulations 1-39 and applicable U.S. Coast Guard regulations.

3.2.6 Power Plant Cooling Retrofits and Other Desalination Projects

In 2010, the State Water Resources Control Board (SWRCB 2010) adopted a Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (Once Through Cooling Policy [OTC Policy]) that established technology-based standards to reduce harmful effects such as entrainment and impingement on marine and estuarine life from power plant cooling water intake structures. Implementation of the OTC Policy to date has led to a decrease in seawater intake by coastal power plants for OTC statewide. Locally, since commencing operation in 1958, operators of the HBGS, including AES, have used OTC using seawater to cool steam produced by the power plant (California Energy Commission 2014a). AES plans to cease using seawater for OTC by or before December 31, 2020, in compliance with the SWRCB OTC Policy. (The SWRCB could modify this date if power from the Station's generating units is required for local electricity reliability.)

In 2015, the SWRCB (2015b) amended the Water Quality Control Plan for the Ocean Waters of California (Ocean Plan) to address effects associated with the construction and operation of seawater desalination facilities. This "Desalination Amendment" supports the use of ocean water as a reliable supplement to traditional water supplies while protecting marine life and water quality and provides a uniform, consistent process for permitting of seawater desalination facilities statewide. The Lease Modification Project activities are proposed by Poseidon to meet the requirements of the Desalination Amendment ~~for~~ and to reduce marine mortality associated with the HB Desalination Plant, one of many facilities proposed or already in operation along California's coast (see Figure 3-2 above).

Table 3-1. Relevant Cumulative Projects in HB Desalination Plant Area

Project # and Name	Location	Description	Status
1. Huntington Beach Generating Station Demolition and Replacement with Huntington Beach Energy Project	21730 Newland St.	Power plant demolition and re-build.	Approved by CEC in 2014. Demolition has started onsite.
2. Ascon Landfill Remediation	Southwest Corner of Magnolia St. and Hamilton Ave.	On-site cleanup activities.	Planning
3. Magnolia Oil Storage Tank and Transfer Facility Demolition and Removal	21845 Magnolia St. (west side of Magnolia St. and NE of Magnolia Marsh)	Demolition and removal of three empty above ground crude oil storage tanks, approximately 2,342 linear feet of above-ground transfer piping, and ancillary site improvements at a former oil storage and pumping facility.	In Progress
4. Magnolia Oil Storage Tank Redevelopment Project	21845 Magnolia St. (opposite corner of Magnolia St. and Banning Ave.)	29 acres with 250 housing units, including single-family homes townhouses; lodge/ hostel with 175 rooms and guest house with 40 rooms (together totaling 211,000 ft^2); 19,000 ft^2 of retail space; park space; and pedestrian and bicycle connections and trails.	No Application Filed
5. Hilton Waterfront Beach Resort Expansion	21100 Pacific Coast Highway (PCH) (bounded by Pacific Ave. (north), Twin Dolphin Dr. (east), PCH (south), and Hilton Waterfront Beach Resort (west)	156 new guestrooms and related facilities.	Under Construction
6. Pacific City	Along PCH, between Huntington St. and First St.	516 residential apartment units, 191,000 ft^2 of commercial, retail, restaurant, entertainment, office, and hotel development. Entitlement Plan Amendment applications have been submitted separately by each site owner/developer to revise original 2004 approvals	Under Construction
7. Atlanta Avenue Widening Project	South side of Atlanta Ave., between Huntington St. and Delaware St.	Widen the south side of Atlanta Avenue, between Huntington Street and Delaware Street.	Adopted

Table 3-1. Relevant Cumulative Projects in HB Desalination Plant Area

Project # and Name	Location	Description	Status
8. Oceanside Properties Mixed Use Building (Morning Jade)	122-124 Main Street (east side of Main Street between PCH and Walnut Avenue)	Partial demolition of two existing commercial buildings and construction of a new approximately 9,500 ft^2 mixed use building to include retail, offices, and residential dwelling units.	Adopted
9. Pierside Pavilion Expansion	300 PCH (between Main Street and 2nd Street)	Demolition of part of the existing structure and construct a connecting four-story mixed-use, visitor serving/office building and infill expansion by extending existing storefronts.	Plan Check
10. Main Street Commercial Building	401 Main Street (NW corner of Main Street and Orange Avenue)	Construction of a 12,600 ft^2 two-story commercial building on a parcel in the coastal zone.	Planning
11. PCH Mixed Use Development	602-620 PCH (between 6th Street and 7th Street)	Construction of a 109,314 ft^2 mixed-use project consisting of condominium units, retail and restaurant use, parking spaces, and entertainment for proposed restaurant in coastal zone.	Planning
12. Surf City Nights	Main St. (between PCH and Orange Ave.)	The Surf City Nights street festival operates every Tuesday night on Main Street.	Adopted
13. Brookhurst Street Bridge	Near border between Brookhurst Marsh and Talbert Marsh	Maintenance activities on the existing Brookhurst Street bridge that are intended to restore the integrity of its original design.	In progress Draft Mitigated Negative Declaration No. 2014-006
Beach Nourishment Projects (e.g., Santa Ana River Sand Management Project) (see Coastal Sediment Management Workgroup 2017)	Offshore Orange County (e.g., West Newport and China Cove in Newport Beach, Newport and Huntington harbors, Huntington State Beach and North Beach in San Clemente)	Since the 1940s, sand has been dredged from the Santa Ana River and other areas and placed on beaches to replace eroded sand and maintain recreational value. One or two beach nourishment projects are expected within the next 10 years (based on a long-term average of every 5 years). A recent project began in October 2016 and is scheduled to run through May 2017.	Ongoing Every few years in Orange County No regular schedule
Marine Transportation-Related Projects			
San Onofre Nuclear Generating Station Units 2 and 3 Decommissioning	Northern San Diego County	Marine transport of construction equipment round trips between Port of Long Beach and southward	Draft EIR in progress

Table 3-1. Relevant Cumulative Projects in HB Desalination Plant Area

Project # and Name	Location	Description	Status
Middle Harbor Redevelopment	Port of Long Beach	Construction in Port of Long Beach	In progress
Pier G Modernization	Port of Long Beach	Construction in Port of Long Beach	In progress
Berth Improvement Projects	Port of Los Angeles	Construction in Port of Los Angeles	Varies
Becker and Legacy Wells Abandonment and Remediation Project	Summerland Beach, Santa Barbara County	Marine transport of construction equipment round trips between Port of Long Beach and Summerland Beach (northward)	Draft EIR in progress

4.0 ENVIRONMENTAL SETTING AND IMPACT ANALYSIS

INTRODUCTION

Section 4 of this Supplemental Environmental Impact Report (EIR) analyzes the potential significant environmental impacts of the proposed *Seawater Desalination Project at Huntington Beach: Outfall/Intake Modifications & General Lease — Industrial Use (PRC 1980.1) Amendment* (**Lease Modification Project**). As discussed in Section 1, *Introduction*, the information here supplements information in the September 2010 Final Subsequent EIR (2010 FSEIR) certified by the city of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA). The 2010 FSEIR analyzed potential significant impacts associated with construction and operation of the 50 million gallon per day (MGD) Huntington Beach Desalination Plant (HB Desalination Plant or **2010 Project**). Table 4-01 identifies the environmental issue areas analyzed in the 2010 FSEIR, those analyzed in Section 4 of this Supplemental EIR, and those found not to be substantially affected by the Lease Modification Project.

Table 4-01. Environmental Issue Areas Analyzed

City's 2010 FSEIR (by Section No.)	**This Supplemental EIR** (by Section No.)
4.13 Land Use/Relevant Planning 4.14 Geology, Soils, and Seismicity 4.15 Hydrology, Drainage, and Storm Water Runoff 4.16 Air Quality 4.17 Noise 4.18 Public Services and Utilities 4.19 Aesthetics/Light & Glare 4.20 Hazards and Hazardous Materials 4.21 Construction Related Impacts (Hydrology and Water Quality; Air Quality; Noise; Underground Utilities; Aesthetics/Light and Glare; Hazards and Hazardous Materials; Traffic; Biological Resources; Cultural Resources) 4.22 Ocean Water Quality and Marine Biological Resources 4.23 Product Water Quality 4.24 Climate Change **<u>Effects Found Not to be Significant</u>** • Population and Housing • Mineral Resources • Agriculture and Forest Resources • Several subsections of Hazards and Hazardous Materials, Noise, and Transportation/Traffic	4.11 Ocean Water Quality and Marine Biological Resources 4.12 Aesthetics/Light & Glare 4.13 Air Quality 4.14 Cultural Resources 4.15 Cultural Resources – Tribal 4.16 Greenhouse Gas Emissions 4.17 Hazards and Hazardous Materials 4.18 Noise and Vibration 4.19 Recreation 4.20 Transportation (Marine) **<u>Other Commission Considerations</u>** 8.1 Climate Change and Sea-Level Rise 8.2 Environmental Justice **<u>No Impact/Not Significant</u> *** • Agriculture and Forestry Resources • Biological Resources (Terrestrial) • Geology and Soils • Hydrology, Drainage, and Storm Water Runoff • Land Use and Planning • Mineral Resources • Population and Housing • Public Services • Transportation/Traffic (onshore) • Utilities and Service Systems (including Product Water Quality)

* See discussion in Section 4, *Environmental Setting and Impact Analysis*.

The following events are also relevant to the analysis in Section 4.

- After the City approved the 2010 Project, the California State Lands Commission (CSLC), as a CEQA responsible agency, amended PRC 1980.1 to include applicable components of the 2010 Project (Item 62, October 29, 2010). This 20-year lease (through August 7, 2026) provides for:
    - Continued use by AES of the seawater intake pipeline and discharge pipeline (outfall) for Once-Through Cooling (OTC) at the Huntington Beach Generating Station (HBGS)
    - Future use of the pipelines for co-located and stand-alone operations of the HB Desalination Plant.
- In 2015, the State Water Resources Control Board (SWRCB) adopted the Desalination Amendment to the *Water Quality Control Plan for the Ocean Waters of California* (Ocean Plan) (SWRCB 2015b). The Desalination Amendment:
    - Addresses effects of the construction and operation of seawater desalination facilities, including intake and brine discharge technology considerations related to wedgewire screens and multiport diffusers
    - Requires that the Santa Ana Regional Water Quality Control Board (RWQCB), in consultation with the SWRCB, determine whether the HB Desalination Plant complies with Water Code section 13142.5, subdivision (b) and the requirements set forth in the Ocean Plan (see Section 1.2.2, *Santa Ana RWQCB Permitting Status*)
- In 2016, Poseidon Resources (Surfside) LLC (Poseidon or Applicant) applied to the CSLC to amend PRC 1980.1 to add 1 millimeter wedgewire screens and a multiport diffuser to the offshore ends of the intake and discharge pipelines, respectively, to reduce marine mortality as well as to reduce seawater intake volume for desalination operations to 106.7 MGD. If the Santa Ana RWQCB, pursuant to Water Code section 13142.5, subdivision (b), determines subsurface intakes are not feasible and brine cannot be diluted by wastewater and there are no live organisms in the discharge, the Desalination Amendment requires the installation of screens and a diffuser (see Ocean Plan Chapters III.M.2.d(1)(c)(i) and III.M.2.d(a),(b)).

The City does not have a discretionary action with respect to the Lease Modification Project due to its lack of jurisdiction over the tide and submerged lands on which the screens and diffuser would be installed. The CSLC, in its continuing role as responsible agency and consistent with State CEQA Guidelines section 15163, is evaluating the incremental differences between the approved 2010 Project and the proposed Lease Modification Project when evaluating whether such modifications would result in any significant environmental impacts. (*Benton v. Board of Supervisors* (1991) 226

Cal.App.3d 1467, 1482; *Temecula Band of Luiseno Mission Indians v. Rancho Cal. Water Dist.,* 43 Cal.App.4th 425, 437).

In order to facilitate understanding of potential Lease Modification Project impacts and eliminate the need for frequent reader referral to other analyses, this Supplemental EIR incorporates previously published information by reference, including information from:

- Relevant portions of the 2010 FSEIR, which analyzed significant environmental impacts associated with construction and operation of the 2010 Project
- The CSLC's 2010 CEQA Findings and Statement of Overriding Considerations (Item 62, October 29, 2010; Appendix E1)
- The Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes (SED), which generally evaluated construction and operation impacts associated with wedgewire screens and diffusers (SWRCB 2015a; Appendix E2)
- Other recent environmental assessments for nearby projects, such as the May 2014 California Energy Commission (CEC) Final Staff Assessment for the Huntington Beach Energy Project (CEC 2014b), as well as City planning documents, Geographic Information System data, and other analyses prepared by or for the Santa Ana RWQCB and California Coastal Commission (CCC)

Sections 4.1 through 4.11 below describe the environmental setting (baseline conditions) to increase understanding of the conditions that exist prior to Lease Modification Project implementation and the relationship between baseline conditions and potential impacts. Each section also describes the approach used to analyze and determine the significance of potential impacts. If applicable, some sections recommend mitigation measures to reduce significant impacts. Throughout Section 4, both impacts and corresponding mitigation measures (MMs) are identified by a bold letter-number designation.

ASSESSMENT METHODOLOGY

Environmental Baseline

Baseline conditions are defined as the existing physical setting that may be affected by a project (State CEQA Guidelines, § 15125, subd. (a)) (see Section 1.4.2, *Baseline and Future Conditions*). The following environmental setting, based on the 2010 Project as currently approved, represents the baseline physical conditions CSLC staff used to determine if impacts from the Lease Modification Project and alternatives are significant (impacts are defined as changes to the environ-mental setting attributable to Lease Modification Project components or operations).

- The intake and discharge facilities are existing, and part of the baseline conditions. The Lease Modification Project evaluates changes to the existing facilities.
- Construction activities would be performed offshore, near the ends of the existing intake and discharge facilities. Construction vessels would travel to these work areas from the Port of Long Beach (POLB) or closer ports (e.g., Los Alamitos or Newport). Onshore conditions are therefore not described for most resources.

Environmental Setting

Primary activities associated with the Lease Modification Project focus on the seaward ends of the existing intake and discharge pipelines offshore of the HBGS, which are located at a depth of approximately 33 feet mean lower low water (MLLW) (see Figure 1-1). This area encompasses the southwestern edge of the 11.78-acre lease parcel (PRC 1980.1). Additional areas used would include: offshore waters between the POLB and offshore work areas, and in the onshore area immediately adjacent to the Port facilities. All primary activities for the Lease Modification Project are located in State waters where the CSLC has primary jurisdiction over the proposed construction activities. The area is affected by rising sea levels as addressed in Section 8.1, Project-Specific Sea-Level Rise Considerations.

Regulatory Framework

Each of the environmental issue areas analyzed in this Supplemental EIR is considered in light of Federal, State, regional, and local laws, regulations, and policies that apply to the issue area. Appendix A summarizes applicable Federal and State laws, regulations and policies. Applicable regional and local laws, regulations, and policies are also identified in each environmental resource section or referenced from the 2010 FSEIR.

Significance Criteria

Significance criteria are identified for each environmental issue area; these criteria serve as benchmarks for determining if a component action will result in a significant adverse environmental impact when evaluated against the baseline. According to State CEQA Guidelines section 15382, a significant effect on the environment means “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project….” Significance criteria relevant to each section are primarily drawn from the 2010 FSEIR significance criteria, with Appendix G of the State CEQA Guidelines, CSLC policies and standards, and other applicable local regulatory agency policies and standards indicated within each section.

Impact Analysis

The terms “effect” and “impact” used in this document are synonymous and can refer to effects that are either adverse or beneficial.

- **Direct effects** are caused by the Lease Modification Project and occur at the same time and in the same place as the Lease Modification Project.
- **Indirect effects** are caused by the Lease Modification Project but occur later in time or further in distance, though still reasonably foreseeable.
- **Residual impacts** are impacts that still meet or exceed significance criteria after application of mitigation and, therefore, remain significant.
- **Cumulative impacts** are those resulting from the Lease Modification Project when combined with similar effects of other past, present, and reasonably foreseeable future projects (regardless of which agency or person undertakes them). Cumulative impacts could result from individually insignificant but collectively significant actions that take place over time.
- **Short-term impacts** are those expected to occur during the Lease Modification Project that do not have lingering effects for an extended period once the project is complete.
- **Long-term impacts** are those that persist for an extended period, including after completion of the Lease Modification Project.

A determination will be made, based on analysis of any impact within each affected environmental issue area and compliance with any recommended mitigation, of the level of impact remaining in relation to pertinent significance criteria. Impacts are classified as one of five categories.

Significant and Unavoidable	A substantial or potentially substantial adverse change from the environmental baseline that meets or exceeds significance criteria, where either no feasible mitigation can be implemented or the impact remains significant after implementation of mitigation measures
Less than Significant with Mitigation	A substantial or potentially substantial adverse change from the environmental baseline that can be avoided or reduced to below applicable significance thresholds
Less than Significant	An adverse impact that does not meet or exceed the significance criteria of a particular resource area and, therefore, does not require mitigation
Beneficial	An impact that would result an improvement to the physical environment relative to baseline conditions
No Impact	A change associated with the project that would not result in an impact to the physical environment relative to baseline conditions

TIMING OF LEASE MODIFICATION PROJECT ELEMENTS

Lease Modification Project elements involve reducing seawater intake volume (compared to the volume approved for the 2010 Project), and installing wedgewire screens and a multiport diffuser pursuant to Ocean Plan Chapter III.M.2.d. Poseidon proposes to install the diffuser first (a 2-month work period), then the screens (a 3-month period), and each installation may occur in a different year. It may be possible, however, for both to be installed at the same time (3 months) pending AES steam generating unit shutdown schedule, weather conditions, ocean conditions, and equipment availability. The "worst-case" impact analyzed in this Supplemental EIR, therefore, would occur during 3 months of concurrent operations for some environmental issue areas (e.g., air quality), or 5 months for other areas. See Table 2-4 in Section 2, *Project Description,* for Poseidon's proposed schedule. Desalination operations and maintenance would occur under modified PRC 1980.1 and continue throughout the end of the lease term (August 7, 2026)

Mitigation Measures and Applicant Proposed Measures (APMs)

In October 2010, as part of the PRC 1980.1 amendment approval, the CSLC adopted all of the mitigation measures presented in the 2010 FSEIR. This Supplemental EIR considers whether any of those mitigation measures require modification and whether new mitigation measures are required to avoid or minimize potential significant impacts of the Lease Modification Project. When significant impacts are identified, feasible mitigation measures are formulated to eliminate or reduce the severity of impacts. The effectiveness of a mitigation measure is determined by evaluating the impact remaining after its application. Impacts that still meet or exceed significance criteria after mitigation are considered residual impacts that remain significant. Implementation of more than one mitigation measure may be needed to reduce an impact to a less than significant level. Any mitigation measures that are ultimately incorporated as part of the proposed Lease Modification Project as part of the Applicant's project description are considered "Applicant Proposed Measures" (APMs) and are no longer considered mitigation under CEQA. If APMs incorporated into a project design will reduce a potentially significant impact to a level below significance criteria, they eliminate the potential for that significant impact since the "measure" is now a component of the action.

Poseidon commits to implementing ~~seven~~ eight APMs to avoid or minimize impacts of the proposed Lease Modification Project. Poseidon has also identified an Applicant Proposed Lease Condition (APLC) to address the structural integrity of the discharge pipeline when operating with a diffuser or with concentrated brine flowing through it (compared to existing conditions); this issue was raised in the 2010 FSEIR and during public scoping. The APLC and APMs are identified in Table 4-02 below. Implementation of the APLC, APMs and mitigation measures is discussed throughout Section 4. The impact analysis assumes that the APMs are implemented, and evaluates whether

additional mitigation is needed beyond the APM requirements. The CSLC's standard practice is to include all measures to eliminate or reduce environmental impacts of a project, whether applicant-proposed or recommended mitigation, in the mitigation monitoring program (MMP), which is provided in Section 7, *Mitigation Monitoring Program*.

Table 4-02. Applicant Proposed Measures (APMs) and Lease Condition (APLC)

APLC-1. Pipeline Integrity Assessment Inspection and Report. Prior to installation of a diffuser on the existing outfall pipeline, Poseidon shall contract with a California registered structural or civil engineer to inspect the outfall. The California registered structural/civil engineer shall prepare an Integrity Assessment Report based on the findings of the inspection. The Report shall include information on: • Past and current inspections by the owner and operator of the outfall pipe • The competence of the outfall pipe and its anchoring system for on-bottom stability from bottom currents and expected wave loading • The outfall pipe's continuing ability to support the selected diffuser design, based on identified industry standards The Report, which shall be submitted to California State Lands Commission (CSLC) engineering and environmental staffs for approval no less than 90 days prior to installation of the diffuser, must demonstrate feasibility of the use of the pipeline to the satisfaction of CSLC Engineering staff based on: (1) a determination of the pipeline's continued structural integrity; (2) an estimate of the remaining service life of the existing outfall with diffuser installed and increased salinity in the offshore pipeline; (3) a schedule for periodic inspections by Poseidon to ensure continued structural integrity.
APM-1. Offshore Construction Best Management Practices (BMPs) to Protect Water Quality. Poseidon's offshore construction contractor shall implement BMPs to protect water quality during offshore demolition and construction, including the control of releases of sediment, coarse particles, concrete, and other materials. The implementation of these BMPs shall be a required part of the contractor's contract for offshore construction work. The BMPs shall be submitted for review and approval by California State Lands Commission (CSLC) staff at least 30 days before the commencement of offshore construction. CSLC may also consult with the Regional Water Quality Control Board staff and the California Coastal Commission staff in considering the BMPs. The BMPs shall include, at a minimum, the following measures. • All metals used in construction shall be marine-grade fasteners and metals that will not corrode, releasing zinc or other toxic material into the water. • The contractor shall implement effective and practicable measures to limit offshore construction debris that could be discharged to the sea floor (e.g., use of mesh nets). After completion of offshore construction, the contractor shall perform a diver survey to identify if hazardous materials (e.g., sharp-edged scraps of metal, cables) have been left onsite. All such materials shall be removed within 72 hours after completion of offshore construction unless a longer timeframe is approved by CSLC staff.
APM-2. Turbidity Minimization and Monitoring Plan. At least 30 days before commencement of offshore construction, Poseidon shall submit a Turbidity Minimization and Monitoring Plan for review and approval by California State Lands Commission (CSLC) staff. CSLC may also consult with Santa Ana Regional Water Quality Control Board and

Table 4-02. Applicant Proposed Measures (APMs) and Lease Condition (APLC)

California Coastal Commission staff in considering the Turbidity Minimization and Monitoring Plan. The Plan shall include, at a minimum, the following elements: • Maximum allowable turbidity levels associated with offshore construction as provided by the California Ocean Plan during offshore construction activities • Measures Poseidon will implement to remain within the maximum allowable turbidity levels, including maintenance monitoring to ensure that the Desalination Amendment turbidity requirements are achieved • Types of equipment to be used to conduct offshore construction activities • Equipment and sediment disposal locations • Qualifications of the observers who will be present at the offshore project site to monitor for turbidity during offshore construction activities (names shall be submitted at the same time or within 1 week of project implementation) • A Monitoring Plan that (1) provides for measuring turbidity within 72 hours and immediately before offshore construction begins to provide baseline levels and monitoring during offshore construction to ensure the construction operator remains within those levels and (2) identifies the location of a control or reference site so a high turbidity reading caused by a large-scale or regional event is not inappropriately attributed to offshore project construction
APM-3. Spill Prevention and Response Plan. At least 60 days before commencement of offshore construction, a Spill Prevention and Response Plan for all vessels to be used for project activities shall be prepared by Poseidon and submitted for review and approval by California State Lands Commission (CSLC) staff that includes at a minimum the following elements: • A list of all fuels and hazardous materials that will be used or might be used during offshore construction, along with Material Safety Data Sheets for each material • Specific protocols for monitoring and minimizing the use of fuel and hazardous materials during offshore construction project operations, including best management practices that will be implemented to ensure minimal impacts to the environment • An estimate of a reasonable worst case release of fuel or other hazardous materials at the offshore construction project site or into coastal waters resulting from the offshore construction activities • A list of all spill prevention and response equipment that will be maintained on the vessels performing the offshore construction activities • The designation of the on-site person with responsibility for implementing the plan • A detailed response and clean-up plan in the event of a spill or accidental discharge or release of fuel or hazardous materials • A telephone contact list of all regulatory and trustee agencies, including CSLC and California Coastal Commission staffs, having authority over the development and/or the project site and its resources to be notified in the event of a spill or material release.
APM-4. Workers Educational Training. A worker education training program shall be conducted for workers engaged in offshore construction. The contents of the training program shall be prepared by a qualified biologist approved by California State Lands Commission (CSLC) staff. The program shall include at a minimum the following elements. • Measures to prevent indirect impacts during construction and maintenance activities shall be covered, including delivery, storage, and use of materials and chemicals as

Table 4-02. Applicant Proposed Measures (APMs) and Lease Condition (APLC)

they relate to the protection of aquatic habitat. • Training materials should include laws and regulations that protect federally-listed species and their habitats, the consequences of non-compliance with laws and regulations and a contact person (i.e., maintenance activity manager) in the event that protected biological resources are affected. • Training shall take place at the kick-off meeting and any subsequent meetings that may take place if additional contractors are employed during additional maintenance activities. A sign-in sheet will be circulated for signatures to all personnel that attend the workers' educational training to confirm that program materials were received and that they understand information presented.
APM-5. Sensitive Marine Species Monitoring and Best Management Practices (BMPs) to Protect Marine Biological Resources. At least 30 days before commencement of offshore construction, Poseidon shall submit a Sensitive Marine Species Monitoring and Mitigation and BMP Implementation Plan for review and approval by California State Lands Commission (CSLC). CSLC may consult with California Department of Fish and Wildlife (CDFW) staff, California Coastal Commission staff, and other applicable agency staffs in considering the Sensitive Marine Species Monitoring and BMPs. The Plan shall include, at a minimum, the elements below. Poseidon shall write into the contract of each applicable contractor hired to conduct offshore work, including any required in-water pile driving, that all BMPs identified in the Plan shall be implemented. In-water construction activities shall not commence until the Plan has been approved. • The Plan shall identify the Exclusion/Shutdown and Behavioral Harassment (Impact) Zone for the marine mammals, sea turtles, and special-status marine bird species that may occur in the offshore construction area • The Plan shall identify measures that will be taken if marine mammals, sea turtles or special-status bird species are within the Impact Zone. These measures may include temporarily halting construction activities until the animal or bird has departed the Impact Zone, as described below. • The Plan shall list the equipment that marine wildlife monitors (MWMs) will have or be provided with to effectively monitor marine species (e.g., binoculars, radios or cell phones, log books). • Poseidon shall provide for approval by CSLC staff the names, qualifications, and roles of three or more MWMs. Selected MWMs shall be able to identify the types and behavior of the marine mammals, sea turtles, and special-status marine bird species that may occur in the offshore construction area. • Prior to the start of in-water work, MWMs shall be located where they have a clear view of marine waters in the Impact Zone and beyond. MWMs shall be on site and in radio or phone contact with offshore construction personnel at all times in-water construction is conducted. MWMs shall monitor the Impact Zone for 30 minutes before, during, and for 30 minutes after in-water construction activities, including any pile-driving. • At a minimum, MWMs shall collect the following information daily: (1) general location(s) of MWMs and marine wildlife observations; (2) date/time monitoring begins/ends; (3) activities occurring during each observation period; (4) weather parameters (e.g., percent cover, visibility) and conditions (e.g., sea state); (5) species observed and number of individuals; (6) description of any marine wildlife behavior

Table 4-02. Applicant Proposed Measures (APMs) and Lease Condition (APLC)

patterns, including bearing and direction of travel and distance from pile driving activities; (7) other human activity in the area. MWMs shall keep a log book of notes about sightings of marine mammals, special-status birds or sea turtles. Entries in the log shall be made at least hourly, even if the entry is "None observed." Reports shall be emailed or faxed to CSLC staff daily.

- Prior to the start of any pile driving operations, if a marine mammal or sea turtle is sighted within or approaching the Impact Zone, MWMs shall notify the on-site construction lead (or other authorized individual) to delay pile driving until the animal has moved out of the Impact Zone or the animal has not been re-sighted within 15 minutes (for pinnipeds and small cetaceans) or 30 minutes (for large cetaceans).
- If a marine mammal or sea turtle is sighted within or on a path toward the Impact Zone during pile driving activities, pile driving shall cease until that animal has moved out of the Impact Zone or 15 minutes (pinnipeds and small cetaceans)/30 minutes (for large cetaceans) has lapsed since the last sighting.
- MWMs shall have authority to temporarily halt in-water project activities if those activities pose a threat to individuals of a special-status species, and to suspend project activities until the animals have left the area. If due to fog, rain, or other periods of limited visibility the Impact Zone cannot be monitored, MWMs have the authority to direct cessation (or continuation) of construction activities based on adequate visibility, observed abundance of marine mammals and sea turtles, and their ability to view the Impact Zone. Periodic reevaluation of weather conditions and reassessment of the continuation/cessation recommendation shall be completed by the MWMs.
- Within 30 days of the last day of each offshore work period that requires a MWM on the construction vessel, Poseidon shall submit to CSLC staff a Final Marine Wildlife Monitoring Report and copies of log books prepared by the approved MWMs that include at a minimum:
  - an evaluation of the effectiveness of monitoring protocols/procedures
  - reporting of all marine mammal, sea turtle, and other wildlife sightings (including species and numbers)
  - any wildlife behavioral changes that may be attributed to project construction
  - all project changes (e.g., delays, work stoppages, etc.) due to the presence in the area of marine wildlife species
- Operators of vessels traveling to the construction site shall maintain a minimum distance of 1,000 feet from whales and sea turtles. Vessels shall not cross directly in front of whales or sea turtles. When paralleling whales, vessels shall operate at a constant speed that is not faster than the whales at a distance less than 1,000 feet. If the whale exhibits evasive, defensive or other adverse behaviors, the vessel shall decrease speed and change direction and increase distance from the whale until the distance is sufficient to reduce stress displayed by the whale.
- Any collisions with marine wildlife shall be reported promptly to CSLC and wildlife agency (National Marine Fisheries Service, CDFW) staffs pursuant to each agency's reporting procedures.
- All daily vessel trips used for construction and maintenance activities will originate from local ports.
- Divers shall not attempt to interact with any marine mammals or sea turtles.

Table 4-02. Applicant Proposed Measures (APMs) and Lease Condition (APLC)

APM-6. Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map. At least 30 days, but not more than 60 days, before the start of offshore construction, Poseidon shall submit an Anchoring, Riprap Reconfiguration, and Dredging Plan for review and approval by California State Lands Commission (CSLC) staff. CSLC staff may also consult with Coastal Commission staff, in considering the Anchoring, Riprap Reconfiguration and Dredging Plan. The Plan shall ensure that impacts on benthic environments are minimized during installation of the wedgewire screens and diffuser, as well as maintenance buoys if required, riprap reconfiguration, and dredging. This Plan shall identify and map Preclusion Areas—all areas of kelp, seagrasses, and hard substrate found within the work area—that shall not be impacted by placement of vessel and buoy anchors, by dragging anchor or buoy lines or cables, by riprap placement, or by dredging spoils during Lease Modification Project construction and maintenance activities. Any surveys subject to the CSLC's Low-Energy Offshore Geophysical Permit Program shall be conducted by CSLC-permitted operators. Within 30 days after completion of offshore construction, Poseidon shall submit to CSLC staff for approval: (1) an "as-built" map overlaying the Preclusion Area Map with Global Positioning System coordinates showing all areas of direct disturbance, anchor and buoy locations, and riprap boundaries, and (2) the procedures Poseidon shall implement to remedy any disturbance that may have occurred within the Preclusion Area due to Poseidon's construction activities.
APM-7. Energy Minimization and Greenhouse Gas (GHG) Reduction Plan (Updated). Poseidon shall implement the Energy Minimization and GHG Reduction Plan, as updated on February 27, 2017, to offset total direct and indirect GHG emissions from construction and operation of the HB Desalination Plant, including the Lease Modification Project.
APM-8. Composition and Maintenance of Wedgewire Screens. Poseidon shall install stationary wedgewire screens with a slot width of 1 mm and a through velocity of 0.5 feet/second or less (per Ocean Plan Section III.M.2.d(1)(c) requirements) at the existing HBGS intake pipeline riser prior to desalination plant commercial operation. The composition of the screens shall be stainless steel, unless Poseidon demonstrates to the satisfaction of California State Lands Commission staff that the use of copper nickel alloy screens would not result in chemical leaching in excess of Ocean Plan Water Quality Objectives for Protection of Marine Life standards. Such demonstration must be based on data that have been reviewed and approved by the State and Regional Water Boards' staff and California Coastal Commission staff. The screens shall be maintained through boat-based air-burst wedgewire screen cleaning methods.

Cumulative Impacts Analysis

CEQA requires an EIR to discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (State CEQA Guidelines, § 15130). A cumulative impact is an impact created through a combination of the project and other projects that cause similar impacts. Section 3, *Cumulative Projects*, defines the applicable geographic scope of the cumulative analysis, and lists future planned and approved projects to be included in the cumulative environment. The impact analysis for cumulative impacts is presented at the end of each major subsection within Section 4.

Alternatives

Pursuant to State CEQA Guidelines section 15126.6, an EIR must describe and evaluate a range of reasonable alternatives that would feasibly attain most of a project's basic objectives and would avoid or substantially lessen any of the significant impacts of a project as proposed. The State CEQA Guidelines also state that the range of alternatives requiring evaluation in an EIR is governed by the "rule of reason" (§ 15126.6, subd. (f)); that is, an EIR needs to describe and evaluate only those alternatives necessary to permit a reasoned choice and foster informed decision making and public participation. Section 5, *Alternatives*, describes the alternatives to the Lease Modification Project and includes the impact analysis for each alternative scenario considered. A summary of impacts of each alternative, in comparison with the impacts of the Lease Modification Project, is included both in the Executive Summary and Section 6, *Other Required CEQA Sections and Environmentally Superior Alternative*.

NO IMPACTS/NOT SIGNIFICANT IMPACTS

Based on an initial review and analysis, the Lease Modification Project would have no impact or a less-than-significant impact on certain environmental issue areas; these issue areas are therefore not analyzed in this Supplemental EIR. Activities associated with the Lease Modification Project would occur at the offshore ends of the intake and outfall pipelines. Marine vessels would transport equipment to the site from the POLB or closer ports (e.g., Los Alamitos or Newport). Therefore, the Lease Modification Project would have no impact on the following land-based issue areas:

- Agriculture and Forestry Resources
- Biological Resources (Terrestrial)
- Hydrology, Drainage, and Storm Water Runoff
- Transportation/Traffic (Onshore)

Additional reasons why no significant impacts are expected related to other identified issue areas are described below, as required by State CEQA Guidelines section 15128.

Geology and Soils

The City, as CEQA lead agency, analyzed geology-related impacts associated with the 2010 Project in the 2010 FSEIR (Section 4.2, Geology, Soils, and Seismicity), which is incorporated by reference in this Supplemental EIR. In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB Desalination Plant operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted the following Findings associated with Geology, Soils, and Seismicity (Item 62, October 29, 2010).

- The [2010 Project] will have no significant impact due to landslides on the project area. Less than significant impact.

- The [2010 Project] off site pipelines and underground pump stations will not result in significant impacts related to geology, soils and seismicity. Less than significant impact. In addition, applicable mitigation measures contained within Section 4.9 of the [2010 FSEIR], inclusive, further reduce these less than significant impacts.
- The [2010 Project] may be subject to significant impacts resulting from unstable soils and shallow groundwater conditions in the vicinity of the project area. However, changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the potential significant environmental effects identified in the [2010 FSEIR], including adherence to standard Uniform Building Codes (UBC) conditions and incorporation of mitigation measures GEO-5 through GEO-9, inclusive. Less than significant impact with mitigation.
- The [2010 Project] may be subject to significant hazards from seismicity and faulting. However, changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the potential significant environmental effects identified in the [2010 FSEIR], including adherence to standard UBC conditions and incorporation of mitigation measures GEO-1 and GEO-4. Less than significant impact with mitigation.
- The [2010 Project] may be subject to significant hazards due to high liquefaction potential in the vicinity of the project site. However, changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the potential significant environmental effects identified in the [2010 FSEIR], including adherence to standard UBC conditions and incorporation of mitigation measures GEO-5 through GEO-9, inclusive. Less than significant impact with mitigation.

The mitigation measures above were adopted as part of the CSLC's approval (Item 62, October 29, 2010), and were made, and remain, conditions of PRC 1980.1:

- GEO-1 (Subsurface Fault Investigation)
- GEO-2 (Lateral Spread Potential)
- GEO-3 ("Design-Level" Earthquake-Resistant Structures)
- GEO-4 (Soils and Geotechnical Analysis)
- GEO-5 (Use of Type V Cement)
- GEO-6 (Dewatering)
- GEO-7 (Compressible Soils)
- GEO-8 (Structure Stabilization on Soils Prone to Liquefaction)
- GEO-9 (Detailed Soils and Geotechnical Analysis)

In accordance with the California Supreme Court's decision in December 2015 in *California Building Industry Association v. Bay Area Air Quality Management District*

(2015) 62 Cal. 4th 369, 386, this Supplemental EIR does not identify hazards presented by earthquakes, tsunamis, or other existing hazardous conditions as impacts of the Lease Modification Project. In that case, the Court held that "CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents." With limited exceptions, the Court concluded that the impacts of existing environmental hazards only need to be analyzed if a proposed project risks exacerbating those hazards or conditions. The Lease Modification Project site lies more than 1,500 feet offshore at the ends of the HBGS intake and outfall pipelines, on a continental shelf consisting of flat beach sand with less than one percent slope. Offshore construction and operation of the proposed screens or diffuser would have no impact on geology and soils because such activities would not risk exacerbating the following hazards or conditions:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: (i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault; (ii) Strong seismic ground shaking; (iii) Seismic-related ground failure, including liquefaction; (iv) Landslides

b) Result in substantial soil erosion or the loss of topsoil

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

Land Use and Planning

The City, as CEQA lead agency, analyzed impacts to land uses and relevant plans associated with the 2010 Project in the 2010 FSEIR (Section 4.1, Land Use/Relevant Planning), which is incorporated by reference in this Supplemental EIR. In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB Desalination Plant operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted the following Findings for Land Use/Relevant Planning (Item 62, October 29, 2010).

- The [2010 Project] will not create any significant impacts to surrounding land uses. Less than significant impact.
- The [2010 Project] will not conflict with applicable relevant planning programs. No impact.

The Plans that the City and CSLC found construction, operation, and maintenance activities for the 2010 Project to be consistent with were: City of Huntington Beach General Plan, Local Coastal Program, Zoning and Subdivision Ordinance, South Coast Air Quality Management Plan, Southeast Coastal Redevelopment Plan, the SCAG [Southern California Association of Governments] Regional Comprehensive Plan and Guide, and applicable sections of the California Coastal Act."

Since 2010, a relevant update has been the SWRCB's adoption of the Desalination Amendment, which addresses effects of the construction and operation of seawater desalination facilities. Ocean Plan Chapter III.M.2.d, as amended in 2015, includes considerations for intake and brine discharge technology.

- **Chapter III.M.2.d(1)(c)**. If subsurface intakes are not feasible, the regional water board may approve a surface water intake, subject to the following conditions: (i) The regional water board shall require that surface water intakes be screened. Screens must be functional while the facility is withdrawing seawater. (ii) In order to reduce entrainment, all surface water intakes must be screened with a 1.0 [millimeter] (0.04 in) or smaller slot size screen when the desalination facility is withdrawing seawater.

  In order to minimize impingement, through-screen velocity at the surface water intake shall not exceed 0.15 meter per second (0.5 foot per second).

- **Chapter III.M.2.d(2)(b)**. Multiport diffusers are the next best method for disposing of brine when the brine cannot be diluted by wastewater and when there are no live organisms in the discharge. Multiport diffusers shall be engineered to maximize dilution, minimize the size of the brine mixing zone, minimize the suspension of benthic sediments, and minimize mortality of all forms of marine life.

Operational impacts associated with wedgewire screens and diffusers are: (1) generally evaluated in the SWRCB (2015a) *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes* (SED) as part of the Desalination Amendment, which is also incorporated by reference in this Supplemental EIR. As discussed in Section 1, Introduction, compliance with the Desalination Amendment will be determined by the Santa Ana RWQCB in coordination with the SWRCB; consistency with the California Coastal Act will be determined by the CCC.

Lease Modification Project activities would occur entirely offshore on tide and submerged lands under the CSLC's jurisdiction and will require an amendment to Poseidon's existing General Lease—Industrial Use. No local agency approvals (e.g., zoning changes) are required. At this offshore site, the Lease Modification Project would

not physically divide an established community or conflict with any applicable habitat conservation plan (HCP) or natural community conservation plan (NCCP).[19]

Mineral Resources

The City found the 2010 Project would have no significant impact on mineral resources, and this impact was not analyzed in the 2010 FSEIR. According to the U.S. Geological Survey (USGS 2017) Mineral Resource Data System, no known mineral resources are located onsite or in the immediate area. Offshore construction and operation of the screens or diffuser would have no impact on mineral resources because they would not:

a) result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State

b) result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan

Population and Housing

The City found the 2010 Project would have no significant impact on population and housing, and this impact was not analyzed in the 2010 FSEIR. During Lease Modification Project construction and operation, the number of long-term employees at the HB Desalination Plant would not change; short-term increases in workers would occur during construction (5 months if the diffuser and screens are installed separately, 3 months if concurrently). Therefore, the Lease Modification Project would not:

a) substantially increase population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through road extensions)

b) displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere

c) displace substantial numbers of people, necessitating the construction of replacement housing elsewhere

Public Services, Utilities and Service Systems, and Product Water Quality

The City, as CEQA lead agency, analyzed impacts to public services and utilities associated with the 2010 Project in the 2010 FSEIR (Section 4.6, Public Services and Utilities), which is incorporated by reference in this Supplemental EIR. In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB

[19] The Orange County Central and Coastal Subregion NCCP and HCP cover 208,000 acres over two reserve areas (U.S. Fish and Wildlife Service [USFWS] 2007a); the closest areas is about 3 miles southeast of the Lease Modification Project site. The Orange County Southern Subregion HCP covers 132,000 acres (USFWS 2007b) and is approximately 16 miles east of the Lease Modification Project site.

Desalination Plant operations on sovereign land for the remaining 20-year lease term (through August 2, 2026). Not including categories that are not relevant to the CSLC's jurisdiction (e.g., fire and police services, schools and libraries, wastewater, stormwater drainage, water supply, electricity, and potable water quality), the CSLC adopted the following Findings associated with public services and utilities and service systems (Item 62, October 29, 2010):

- The [2010 Project] will not have a significant impact on the demand for parks and recreational facilities within the City. Less than significant impact.
- The [2010 Project] will not have a significant impact related to solid waste. Regardless, in order to further reduce this potential impact to a less than significant impact, mitigation measures PSU-1 and PSU-2 have been incorporated into the analysis under Section 4.6 of the SEIR. Less than significant impact with mitigation.

The offshore Lease Modification Project would not impact or otherwise result in the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for public services such as fire and police protection, schools, parks, or other public facilities. The Lease Modification Project would also not substantially change the demand for utilities including electricity, solid waste, potable water, and wastewater conveyance or:

a) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities

b) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities

c) Require new or expanded entitlements to have sufficient water supplies available to serve the project

d) Result in a determination by the wastewater treatment provider that serves or may serve the Project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments

e) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs

f) Affect Federal, State, and local statutes and regulations related to solid waste

Socioeconomics

Economic or social information may be included in an EIR, as long as economic or social effects of a project are not treated as significant effects on the environment (State CEQA Guidelines, §§ 15064, subd. (e), 15131, subd. (a)). However, economic or social effects of a project may be used to determine the significance of physical changes

caused by the project; for example, if the construction of a new freeway or rail line divides an existing community, the construction would be the physical change, but the social effect on the community would be the basis for determining that the effect would be significant (State CEQA Guidelines, § 15131, subd. (b)). For the Lease Modification Project, the short-term construction period to install the proposed screens and diffuser would not generate socioeconomic effects. In addition, PRC 1980.1 already provides for future use of the HBGS pipelines for co-located and stand-alone operations of the HB Desalination Plant. Thus the economic viability of installing a Seafloor Infiltration Gallery (SIG) or other subsurface intake at the HB Desalination Plant site as a project alternative is outside the scope of this Supplemental EIR.[20]

ASSUMPTIONS

This Supplemental EIR was prepared using the following general assumptions (see Section 1.3.3, *CSLC 2010 Approval and Rationale for Supplemental EIR*).

- The laws, regulations, and standards applicable to an offshore construction project must be applied consistently to the proposed Lease Modification Project. The Santa Ana RWQCB is the agency responsible for renewing the previously issued National Pollutant Discharge Elimination System (NPDES) Permit.
- Poseidon will obtain all required permits and approvals from other agencies and comply with all legally applicable terms and conditions set forth in those permits and approvals.
- Construction, operation, and maintenance of the Lease Modification Project (as described in Section 2, *Project Description)*, including implementation of mitigation measures identified to either reduce or avoid significant adverse impacts, will be monitored in accordance with a Mitigation Monitoring Program.
- Other than changes proposed for the Lease Modification Project, this Supplemental EIR does not address other potential changes to the 2010 FSEIR approved by the City because (1) Poseidon has a vested right in the form of a lease to operate the HB Desalination Plant in both co-located and stand-alone operations, (2) the specific physical nature of any future onshore activities are not known at this time, and (3) the CSLC has no discretionary authority over any changes outside its jurisdiction.

[20] See discussion in Section 1.2.3, *CCC Permitting Status*, on the conclusions of the Independent Scientific Technical Advisory Panel (ISTAP 2014) Phase 2 Report, which included, in part, that a SIG is not economically viable at the Huntington Beach location within a reasonable time frame.

4.1 OCEAN WATER QUALITY AND MARINE BIOLOGICAL RESOURCES

In 2010, the City of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), analyzed impacts to ocean water quality and marine biological resources associated with construction and operation of the Huntington Beach Desalination Plant (HB Desalination Plant or 2010 Project) in Sections 4.7 (Aesthetics/Light and Glare) and 4.9 (Construction-Related Impacts) of its certified Final Subsequent Environmental Impact Report (2010 FSEIR). In 2016, Poseidon Resources (Surfside) LLC (Poseidon) submitted an application to the California State Lands Commission (CSLC) to amend Lease PRC 1980.1 to install, operate, and maintain wedgewire screens and a multiport diffuser on the offshore ends of the existing AES Huntington Beach Generating Station (HBGS) seawater intake and discharge pipelines (hereinafter referred to as the Lease Modification Project). This Supplemental EIR analyzes impacts to ocean water quality and marine biological resources associated with the proposed Lease Modification Project activities for the following reasons.

- The 2010 Project did not include the offshore construction activities that are contemplated in Poseidon's 2016 application.
- The 2010 FSEIR did not address potential impacts to ocean water quality and marine biological resources associated with construction in the Pacific Ocean offshore the City and Huntington State Beach.

Section 4.1 also combines these two issue areas. This section summarizes ocean water quality and marine biological resources in the Lease Modification Project area, evaluates the type and significance of potential impacts based on anticipated changes to existing conditions, and recommends measures if necessary to avoid or reduce significant impacts. The impact area evaluated includes areas near the seaward end of PRC 1980.1 where subsurface anchoring, dredging, riprap reconfiguration, and pile-driving activities are proposed, and along construction vessel routes.

4.1.1 Environmental Setting

4.1.1.1 Ocean Water Quality

The ends of the HBGS intake and discharge pipelines are located at the seaward end of the 11.78-acre lease parcel (PRC 1980.1) at a depth of approximately 33 feet mean lower low water. Ocean salinity is fairly uniform, normally ranging from 33 to 34 parts per thousand (ppt), while dissolved oxygen levels range from about 5 to 13 milligrams per liter (mg/L) (City of Huntington Beach 2010). Natural water temperatures in the ocean fluctuate throughout the year in response to seasonal and diurnal variations in currents, as well from meteorological factors (wind, air temperature, relative humidity, cloud cover, ocean waves, and turbulence). Diurnally, natural surface water temperatures generally vary 1 to 2 degrees Celsius (°C) in the summer and 0.3°C to 1°C in the winter. Reasonably sharp thermoclines (differences between surface and

bottom water temperatures) are known to occur in adjacent nearshore waters at a depth of 12 to 15 meters during the summer, and are typically absent during the winter.

The Talbert Channel and Santa Ana River flow into the ocean about 7,000 and 8,300 feet southeast of the HBGS intake pipeline, respectively. The Orange County Sanitation District (OCSD) deep ocean sewage outfall is located 5 miles offshore of the Santa Ana River at a depth of 195 feet. Bacteria levels are the primary ocean water quality concern in the Lease Modification Project vicinity (City of Huntington Beach 2010).

4.1.1.2 Marine Biological Resources

Information on habitats, invertebrates, and fish species in this section is summarized from a benthic resource assessment of potential anchor locations offshore of the proposed HB Desalination Plant (Tenera Environmental [Tenera] 2016), which was based on results of sampling conducted from 2010 to 2013 for the HBGS ~~National Pollutant Discharge Elimination System (~~NPDES~~)~~ permit monitoring program.

Various sources were used to identify special-status species potentially present in the Lease Modification Project area. For the purposes of this Supplemental SEIR, special-status species are defined as those that meet one or more of the criteria listed below.

- Species listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (FESA) or by the State of California as threatened or endangered under the California Endangered Species Act (CESA).
- Species that are candidates for possible future listing as threatened or endangered under FESA or CESA.
- Species designated by the CDFW as Species of Special Concern, Watch List Species, or species that are considered rare and worthy of consideration by local agencies.

The California Natural Diversity Database (CNDDB) was queried to identify recorded occurrences of marine special-status species within the 7.5-minute quadrangle (quad) encompassing the Lease Modification Project area and the quads on either side (i.e., Seal Beach and Laguna Beach). The results of this query (CDFW 2017) identified green sea turtle (*Chelonia mydas*) and tidewater goby (*Eucyclogobius newberryi*), both of which are listed as threatened under the FESA. The occurrence potential for these and the juvenile or adult life forms of other special-status species is discussed under sections below. Regarding the potential for the larval or planktonic life stages of special-status species to occur within areas potentially impacted by the Lease Modification Project, no special-status species have been collected in the sampling previously conducted for the HBGS or the proposed Huntington Beach Desalination Plant Project (Tenera 2016). However, as explained in Appendix F1, the sampling approach is not designed to detect species that are rare in the sampling area; rather, it is designed for

species for which sufficient data exist (i.e., observations of that species) to make robust estimates of proportional mortality. Two features render special-status species (typically) difficult to detect: larvae of special-status species are almost by definition rare and are sometimes smaller than mesh size used for sampling. Therefore, this Supplemental EIR conservatively assumes that larval stages of special-status species are present.

The 2010 FSEIR generally described marine biota in the 2010 Project vicinity and presented the following findings by MBC Applied Environmental Sciences in its 2001 NPDES monitoring program (City of Huntington Beach 2010).

- There are strong indications that a relatively stable assemblage of organisms occur in the marine habitats near the discharge and, although the numbers and relative abundance rankings of species shift from year to year, no species has either been recruited to or eliminated from the area.
- Organisms in waters adjacent to the HBGS have much broader geographic distributions, extending in most instances to beyond the Southern California Bight.
- Both the sea floor and littoral water habitats occurring near the HBGS discharge site are not home to any threatened or endangered marine species.
- The area does not have any environmentally sensitive habitats such as eelgrass beds, surfgrass, rocky shores, or kelp beds.
- Movement, abundance, and diversity of invertebrate and fish populations along the Huntington Beach coast appear all to be in response to natural ecological factors and not in any way influenced or affected by the HBGS discharge.

Habitats

The seafloor in the Lease Modification Project area is relatively smooth, consisting of fine to medium sand, with sandy silt present further offshore. The results of NPDES sampling for the HBGS show that the offshore sediments comprise approximately 97 percent sand, followed by silts (~2%) and clays (~1%) (Tenera 2016). Rocky riprap that attracts lobsters and reef-associated fish is present at the pipeline ends.

Invertebrate Species

The benthic macrofaunal community (organisms living on the ocean floor or some subsurface layers) offshore of the HBGS has been studied since 1975 as part of the HBGS NPDES permit monitoring program. Dominant invertebrate groups in Southern California soft bottom habitats remain relatively constant over time and are generally distributed by depth, with decreases in benthic abundance and species richness as depth increases (Tenera 2016). Marine worms in the phylum group Annelida

(polychaetes) were, by far, the most abundant group collected from the HBGS NPDES box core sampling off Huntington Beach. The annelid worm *Diopatra splendidissima* was the most frequently observed invertebrate species. *Diopatra* is a relatively large tube-building species that in high abundances stabilizes the sediments and enhances the diversity of the shallow sandy subtidal community by providing stable sediments or a habitat for attachment for other organisms. Other taxa present included members of the phylum group Arthropoda (e.g., crabs and other crustaceans), sea spiders, and mollusks (e.g., snails and clams) (Tenera 2016). Data were also collected on macroinvertebrates living on the seafloor surface (epibenthic). The blackspotted bay shrimp (*Crangon nigromaculata*) was the most abundant macroinvertebrate collected during sampling. The most abundant sedentary taxa included spiny sand star (*Astropecten armatus*) and several varieties of crabs (Tenera 2016).

Fish Species

Fish species that dominate the nearshore inner shelf habitats off Huntington Beach include California tonguefish (*Symphurus atricaudus*), sanddabs (*Citharichthys* spp.), and hornyhead turbot (*Pleuronichthys verticalis*). Other commonly reported species include California lizardfish (*Synodus lucioceps*), shiner perch (*Cymatogaster aggregata*), white seaperch (*Phanerodon furcatus*), white croaker (*Genyonemus lineatus*), and English sole (*Parophrys vetulus*). Analyses of NPDES permit data collected near the HBGS intake showed that white croaker and California lizardfish accounted for more than 93 percent of the total abundance between 2010 and 2013 (Tenera 2016). No special-status fish species ~~occur near~~ were found in the sampling events used to characterize the baseline conditions for the Lease Modification Project site.

Tidewater goby, listed as threatened under the federal FESA, inhabits estuarine and freshwater habitats near major stream drainages. Because of this affiliation with major stream drainages, this species is naturally absent from substantial portions of the California coastline, including between Santa Monica Bay and San Mateo Creek (USFWS 2014), which encompasses the proposed Lease Modification Project area. CNDDB occurrences of tidewater gobies are approximately 15 miles down current of the Lease Modification Project. There is low potential for juvenile or adult tidewater gobies to occur in the project area; however, the presence of larvae is unknown, and therefore is conservatively assumed to be potentially present, as described above.

Seabirds

Many species of seabirds are found in the Southern California Bight, the most numerous of which include shearwaters, phalaropes, gulls, terns, and auklets. Seabirds can be found in the Bight year-round with some species breeding, some overwintering and others migrating through the area. Seabirds most frequently eat fish, squid and crustaceans, and scavenging is common in gulls. Special-status species that may occur in the area include western snowy plover (*Charadrius alexandrinus nivosus*) and

California least tern *(Sterna antillarum browni)*. Western snowy plover, a beach-nesting species, is a federally listed threatened species. Although snowy plover nesting does not occur on the beach adjacent to the HBGS, critical habitat for the species has been designated in the Bolsa Chica Ecological Reserve, and within a protected breeding area of Huntington State Beach. The final rule for USFWS revised designated critical habitat for western snowy plover was published in June 2012 (USFWS 2012), and includes the Bolsa Chica State Beach (subunit CA 46A) and Bolsa Chica Preserve (subunits CA 46B-F), and the Santa Ana River Mouth (Subunit CA 47A). Unit CA 47 at the Santa Ana River Mouth is the closest critical habitat unit to the Lease Modification Project site (1.5 miles away). California least tern (State and federally listed as endangered), another beach-nesting species, may feed in nearshore waters.

Sea Turtles

Sea turtles that occur in Southern California and may occur in the Lease Modification Project area include the green sea turtle (*Chelonia mydas*) and olive ridley sea turtle (*Lepidochelys olivacea*), which are listed as federally threatened species, and the loggerhead sea turtle (*Caretta caretta*) and leatherback sea turtle (*Dermochelys coriacea*), which are listed as federally endangered species.

Marine Mammals

California sea lions are the most common marine mammal species expected to occur in the area. The nearest pinniped haul-out site is located on Santa Catalina Island more than 28 miles away. Southern sea otter (*Enhydra lutris nereis*) may also occur. Cetaceans such as common bottlenose dolphin (*Tursiops truncates)*, Risso's dolphin (*Grampus griseus)*, and Pacific white-sided dolphin (*Lagenorhynchus obliquidens)* typically occur in deeper water further offshore. Other cetaceans that may be present seasonally are gray whale (*Eschrichtius robustus)*, humpback whale (*Megaptera novaeangliae)*, blue whale (*Balaenoptera musculus)*, fin whale (*Balaenoptera physalus)*, and common minke whale (*Balaenoptera acutorostrata).* Normal swimming speeds are about 4 to 8 nautical miles per hour (knots) for whales and 18 to 20 knots for dolphins and porpoises (California Coastal Commission [CCC] 1987). Along the coast, humpbacks, which are known for communicating with their unique sounds, range as far south as southern California in summer; in winter, they migrate to warmer waters off Baha and central Mexico. Gray whales often travel only a few hundred yards offshore and can be observed during their migration (November through early May) along the coast, with mothers accompanying calves during the northward spring migration. Dana Point is a prime whale watching promontory in Orange County (CCC 1987). The Marine Mammal Protection Act (MMPA) makes it illegal to harass marine mammals, including through acoustical harassment. The National Oceanic and Atmospheric Administration (NOAA) can issue incidental take and incidental harassment authorizations for projects that have a negative effect on protected marine mammals.

4.1.1.3 Marine Protected Areas and Areas of Special Biological Significance

Marine Protected Areas (MPAs) are designated by the California Department of Fish and Wildlife (CDFW) and California Department of Parks and Recreation to protect aquatic life and are often associated with Areas of Special Biological Significance (ASBS). The nearest MPA is the Bolsa Chica State Marine Conservation Area, which is approximately 4.3 miles northwest, along the coast (CDFW 2017) (Figure 4.1.1). Most of the larvae anticipated to be within the Lease Modification Project impact area are primarily from open ocean or soft-bottom habitats and not fish species associated with the kelp and rocky reef habitat inside the Southern California coastal MPA reserve network (Tenera 2015). However, this Supplemental EIR assumes that some larval fishes that originated from an MPA (likely Bolsa Chica, given its proximity to the Project) may be present in the Lease Modification Project impact area.

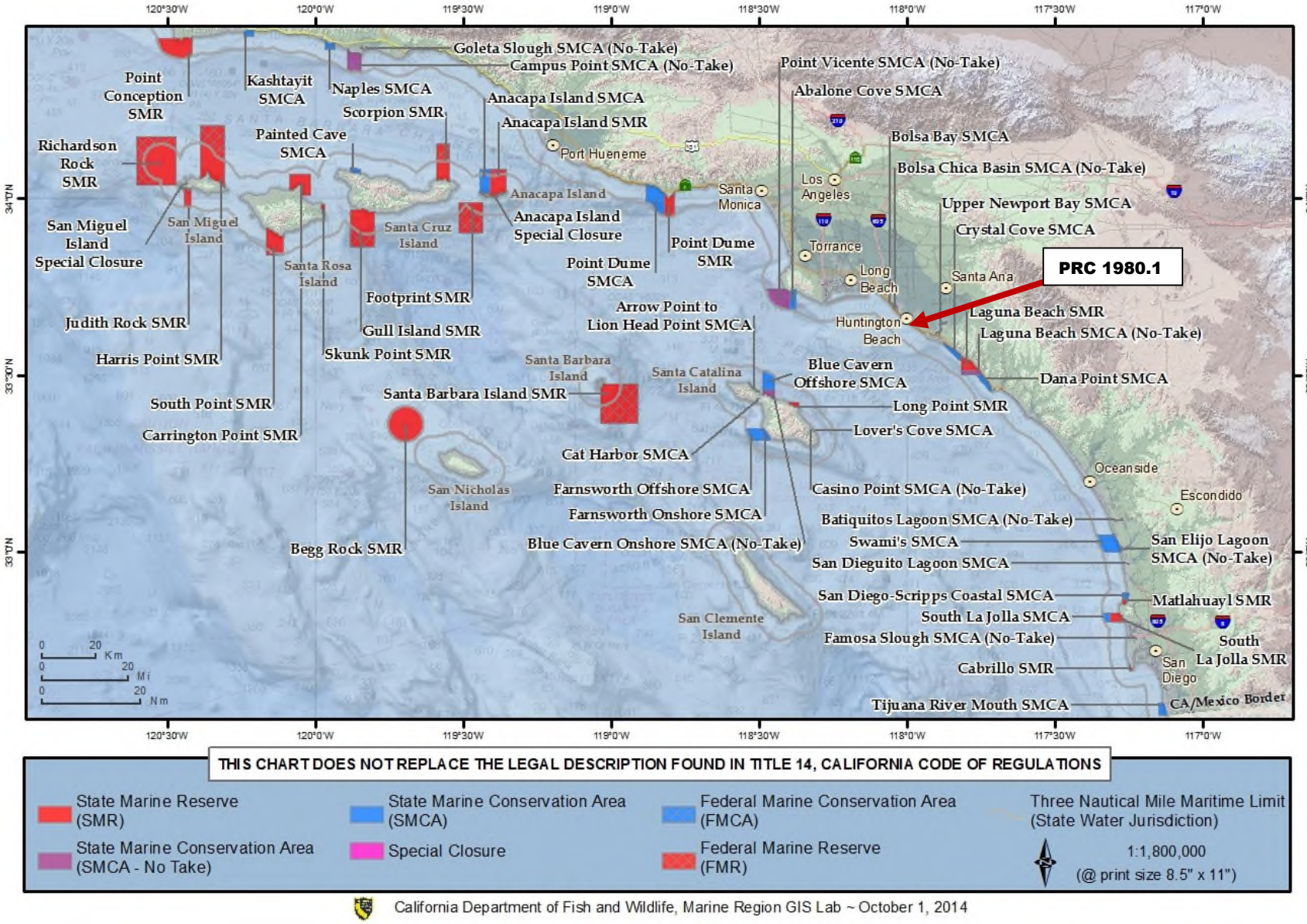
ASBSs are ocean areas monitored and maintained for water quality by the SWRCB. The nearest ASBS to the Lease Modification Project area is the Irvine Coast Robert E. Badham ASBS, which contains some of the last undeveloped coastline in Orange County, located more than 97.6 miles southeast (SWRCB 2017).

4.1.2 Regulatory Setting

Appendix A summarizes relevant state and federal regulations, including new regulations since the City and CSLC adopted findings related to their 2010 Project approvals, including the SWRCB (2015b) adoption of the Desalination Amendment to the California Ocean Plan (Ocean Plan). The Santa Ana Regional Water Quality Control Board (RWQCB), in coordination with the SWRCB, is responsible for determining the HB Desalination Plant's compliance with Water Code section 13142.5, subdivision (b) per the Desalination Amendment, which (if the RWQCB determines that subsurface intakes are infeasible) includes the following requirements to protect marine life associated with desalination project surface intake and discharge.

- Surface water intakes must be screened with a 1 millimeter (0.04 inch) or smaller slot size screen when the desalination facility is withdrawing seawater.
- In order to minimize impingement, through-screen velocity at the surface water intake shall not exceed 0.15 meter per second (0.5 foot per second).
- Multiport diffusers shall be installed for disposing of brine when the brine cannot be diluted by wastewater and when there are no live organisms in the discharge. Multiport diffusers shall be engineered to maximize dilution, minimize the size of the brine mixing zone, minimize the suspension of benthic sediments, and minimize mortality of all forms of marine life.

Figure 4.1-1. California South Coast MPAs



Ocean Plan Section III.M, Implementation Provisions for Desalination Facilities, contains additional regulatory guidance, such as monitoring during desalination operations of effluent and receiving water characteristics and impacts to all forms of marine life, and monitoring for benthic community health, aquatic life toxicity, hypoxia, and receiving water characteristics.

To protect beneficial uses of surface waters, the Ocean Plan establishes water quality objectives for bacterial, physical, chemical, biological, and radioactive constituents. The following receiving water objectives apply to desalination discharges.

- Salinity discharges cannot exceed a daily maximum of 2 ppt above natural background salinity measured no further than 100 meters (328 feet) horizontally from each discharge point, representing the Brine Mixing Zone (BMZ), the actual shape of which is determined by the multiport diffuser. The value of 2 ppt represents the maximum incremental increase above natural background salinity allowed at the edge of the BMZ.
- The BMZ has no vertical limit and to determine the effluent limit necessary to meet the receiving water limitation, the Ocean Plan includes a required ~~methodology~~ technology for brine discharges.
- Initial dilution occurs in an area known as the zone of initial dilution (ZID), within which the density of the discharge is substantially different from that of the receiving water. Typically, constituent concentrations are permitted to exceed water quality objectives within the ZID, which is limited in size. Dilution occurring within the ZID from an operational discharge is conservatively calculated as the minimum probable initial dilution (Dm). Desalination plant owners or operators must meet the dilution standard for constituents other than salinity at the edge of the ZID, which may be larger, smaller, or equal in size to the BMZ. Dilution must be determined using applicable water quality models approved by the RWQCBs in consultation with SWRCB staff.

4.1.3 Significance Criteria

The 2010 FSEIR evaluated two significance criteria for water quality. A third criterion is also discussed below.

- The first (existing or potential sources of ocean water contamination would substantially degrade ocean water quality at the HBGS intake resulting in adverse effects on source water for the Seawater Desalination Project at Huntington Beach) addressed product (potable) water, is not relevant to the Lease Modification Project, and is not evaluated in this document.

- The second criterion, which still applies and is considered in this Supplemental EIR is if the discharge would exceed regulatory (NPDES permit) limits, resulting in a substantial degradation in ocean water quality, for example due to:
    - Increased salinity levels that would cause an exceedance of Ocean Plan Amendment requirements relative to water quality concentration, and acute or chronic toxicity and/or concentration standards for receiving waters for protection of aquatic habitat and human heath
    - Discharges resulting in a sustained salinity level of 40 ppt beyond 100 feet from the base of the discharge tower (10 percent of the ZID)
- A third criterion is if the Lease Modification Project would:
    - Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service
    - Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites
- With respect to these criteria, State CEQA Guidelines, § 15065, subd. (a)(1) requires an EIR to be prepared for a project where there is substantial evidence, in light of the whole record, that the project "has the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community; [or] substantially reduce the number or restrict the range of an endangered, rare or threatened species…." State CEQA Guidelines section 15065 clarifies that findings of significance are not required if a project results in any reduction in habitat or population of a species, but only when habitat would be "substantially reduced" by a project or when a project would cause population levels of a species to "drop below self-sustaining levels."

4.1.4 Environmental Impact Analysis and Mitigation

2010 PROJECT

The 2010 FSEIR found that all ocean water quality impacts associated with construction and operation of the HB Desalination Plant would be less than significant based on compliance with the facility's NPDES permit, stormwater pollution prevention plan (SWPPP), and implementation of appropriate Best Management Practices (BMPs). The 2010 FSEIR also found that elevated salinity levels would conform to discharge limitations established in Santa Ana RWQCB Order No. R8-2006-0034, including

maintaining a salinity level of 40 ppt or less at 100 feet from the base of the discharge tower, and would thereby comply with the Ocean Plan standards in effect at the time. Order No. R8-2006-0034 found that acute toxicity effects are not likely to occur at or below 40 ppt. Areas affected by salinities higher than 40 ppt would not represent substantial ecological effects due to the following factors.

- Benthic areas do not contain natural hard bottom habitats that support sensitive species.
- Fishes, plankton, and other pelagic animals that encounter elevated salinity in the discharge region will have very low exposure times (several hours).
- Foraging areas affected by elevated salinity are limited in size, and would not represent a substantial displacement in foraging areas, or otherwise substantially affect foraging behavior.
- No threatened or endangered species or kelp beds exist near the HBGS outfall.
- No significant effects on Essential Fish Habitat (EFH) functions would occur.

In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB Desalination Plant co-located and stand-alone operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted the following Findings for Geology, Soils, and Seismicity (Item 62, October 29, 2010).

- The [2010 Project] concentrated seawater discharge will not significantly impact ocean water quality or marine biological resources in the area. Less than significant impact.
- The [2010 Project] will not significantly impact ocean water quality or marine biological resources due to the discharge of reverse osmosis membrane cleaning solution through the HBGS outfall. Less than significant impact.
- The [2010 Project] will have less than significant impacts on marine biological resources in regards to impingement and entrainment effects. Less than significant impact.
- The [2010 Project] may have adverse short-term construction related impacts in regards to biological resources. However, changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the potential significant environmental effects identified in the [2010 FSEIR], including standard conditions, project design features and incorporation of mitigation measures CON-40 through CON-48, inclusive. Less than significant impact with mitigation.

In 2015, the SWRCB included in the Final Substitute Environmental Document a summary of previously-adopted EIRs to generally illustrate the impacts associated with

a desalination facility, independent of the then-proposed Desalination Amendment. For Huntington Beach, the SWRCB (2015a) noted:

> *A study was done to estimate impingement and entrainment at the Huntington Beach standalone desalination facility using data from the Huntington Beach Generating Station. Based on these estimations, the Huntington Beach facility intake under stand-alone operation at 152 [million gallons per day (MGD)] (intake flow rate) would result in an estimated average impingement of 0.3 [kilogram (kg)] (0.7 [pound (lb)]) of fish and 0.1 kg (0.2 lb) of shellfish daily. No threatened or endangered species are expected to be impinged. This rate of impingement was considered less than significant. (City of Huntington Beach, 2010) Larval entrainment losses due to operation of the project in the stand-alone operating condition are projected to affect only a small fraction of the larvae within the source water (0.02−0.33 percent). Impacts on marine organisms due to the potential entrainment resulting from the project are relatively small, and would not substantially reduce populations of affected species, or affect the ability of the affected species to sustain their populations. Therefore, entrainment impacts would be less than significant. (City of Huntington Beach 2010)*

SWRCB (2015a) FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT (SED)

In its *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes*, the SWRCB (2015a) noted:

> *[E]ntrainment studies for the Huntington Beach [facility] indicated that fish and invertebrates are entrained by surface water intakes. While these studies concluded that the observed entrainment would have a less than significant impact, it cannot be concluded that all future facilities will also result in no impact on the sustainability of local species, or the recovery and propagation of state and federally listed species. Further, the limited research conducted by the four proponents considered in this analysis did not attempt to evaluate potential impacts to the food web.*
>
> *Larval fish and eggs represent a principal component of the food web. Though entrainment-induced mortality would result in the organisms being consumed upon discharge, those organisms would consist of benthic scavengers and detrital feeders rather than water column predators. It cannot be assumed that impacts associated with impingement will be less than significant for all future facilities. Therefore, it is likely that significant impacts to biological resources may occur with implementation of a particular desalination facility, triggering the need to impose mitigation measures. It is possible that some of these impacts could be significant and unavoidable.*

The SWRCB (2015a) also identified potential impacts related to the installation of intake and outfall structures in offshore waters (onshore activities are not discussed here),

including the following construction impacts and guidance on mitigation to reduce or eliminate any impacts found to be significant.

Impact	Mitigation Measures
May cause the loss or modification of sensitive habitat including habitat for sensitive species	• Construction surveys • Consultation with NOAA Fisheries and CDFW to identify seasonal work windows • Avoidance technology and required monitoring
May be a cause of disturbance or interference with fish migration patterns due to underwater pile-driving noise	• Noise abatement
May cause disturbance of marine habitat through generation of noise and vibration	• Noise abatement

ENVIRONMENTAL IMPACT ANALYSIS – LEASE MODIFICATION PROJECT

The analysis in this Supplemental EIR addresses new ocean water quality and marine biological resource impacts associated with Lease Modification Project activities compared to those impacts analyzed in the certified 2010 FSEIR. These activities are: (1) construction and maintenance activities to install screens and a multiport diffuser on the HBGS pipelines; and (2) operational impacts associated with the proposed reduced seawater intake volume (up to 127 MGD for co-located and 106.7 MGD for stand-alone) and use of the wedgewire screens and multiport diffuser. Table 4.1-7 at the end of this section summarizes potential impacts and proposed mitigation measures. This analysis first considers construction impacts then impacts of operations and maintenance.

4.1.4.1 Construction Impacts

Impact OWQ/MB-1: Impact to Ocean Water Quality of Lease Modification Project Construction Activities.

Construction would be short-term and disturbance would be minimized by Applicant Proposed Measures requiring turbidity minimization, spill response planning, and worker training that would not substantially degrade ocean water quality **(Less than Significant)**.

Impact Discussion

Onshore water quality would not be affected by Lease Modification Project construction or operation.

As shown in Table 2-4 in Section 2, *Project Description*, diffuser installation would occur over approximately 2 months, while screen installation would take about 3 months. Work would be conducted from a barge anchored approximately 1,500 and 1,650 feet offshore. If installation of the screens and diffuser occurs concurrently, work would require two derrick barges and two tugboats on days with low construction activity, plus

two 77-foot-long utility vessels on days with high construction activity. A 20-foot-long monitoring boat for turbidity and marine mammal monitoring would also be deployed daily to each construction site. If the diffuser was installed with the center port open, a derrick barge and tugboat would be present later to cap the center port.

During installation of the wedgewire screens, dredging and trench construction for the intake pipeline ~~concrete~~ header within an approximately 20,000 square feet area would generate short-term turbidity. Depending on final design phase geotechnical confirmation, approximately 1,000 to 3,300 cubic yards of soils would be excavated. Any soils in excess would be placed on a support barge, and offloaded at the Port of Long Beach (POLB) for disposal in an appropriate land-based facility.

Riprap that currently surrounds both the intake and discharge pipeline towers (see Figures 2-7 and 2-8 in Section 2, *Project Description*) would also be side-cast, then replaced and extended when construction is complete. This would enlarge the Lease Modification Project's benthic footprint as follows.

- Intake tower: Protective riprap would be extended by 608 square feet, to include approximately 1,319 square feet outside the existing intake facility footprint
- Discharge tower: Protective riprap would be extended by about 4,000 square feet

Placement of temporary anchors for the construction barges or vessels near the intake and outfall structures could also decrease water clarity if anchor lines are dragged across sand. Unplanned, accidental releases or spills of fuel, oil, or construction vessel bilge could also occur. A potential increase in the frequency and size of oil spills may result from these construction vessels traveling between the offshore construction site and the POLB or closer port (e.g., Newport Beach or Los Alamitos).

Applicant Proposed Measures (APMs)

Poseidon has committed to implement the following four APMs to help minimize construction impacts to ocean water quality (see Section 2.5, *Applicant Proposed Measures*, and Table 4.02 in Section 4.0, *Environmental Setting and Impact Analysis*).

APM-1. Offshore Construction Best Management Practices (BMPs) to Protect Water Quality. Poseidon's offshore construction contractor shall implement BMPs to protect water quality during offshore demolition and construction, including the control of releases of sediment, coarse particles, concrete, and other materials. The implementation of these BMPs shall be a required part of the contractor's contract for offshore construction work. The BMPs shall be submitted for review and approval by California State Lands Commission (CSLC) staff at least 30 days before the commencement of offshore construction. CSLC may also consult with the Regional Water Quality Control Board staff and the California Coastal Commission staff in considering the BMPs. The BMPs shall include, at a minimum, the following measures.

- All metals used in construction shall be marine-grade fasteners and metals that will not corrode, releasing zinc or other toxic material into the water.
- The contractor shall implement effective and practicable measures to limit offshore construction debris that could be discharged to the sea floor (e.g., use of mesh nets). After completion of offshore construction, the contractor shall perform a diver survey to identify if hazardous materials (e.g., sharp-edged scraps of metal, cables) have been left onsite. All such materials shall be removed within 72 hours after completion of offshore construction unless a longer timeframe is approved by CSLC staff.

APM-2. Turbidity Minimization and Monitoring Plan. At least 30 days before commencement of offshore construction, Poseidon shall submit a Turbidity Minimization and Monitoring Plan for review and approval by California State Lands Commission (CSLC) staff. CSLC may also consult with Santa Ana Regional Water Quality Control Board and California Coastal Commission staff in considering the Turbidity Minimization and Monitoring Plan. The Plan shall include, at a minimum, the following elements:

- Maximum allowable turbidity levels associated with offshore construction as provided by the California Ocean Plan during offshore construction activities
- All measures Poseidon will implement to remain within maximum allowable turbidity levels, including maintenance monitoring to ensure that the Desalination Amendment turbidity requirements are achieved
- Types of equipment to be used to conduct offshore construction activities
- Equipment and sediment disposal locations
- Qualifications of the observers who will be present at the offshore project site to monitor for turbidity during offshore construction activities (names shall be submitted at the same time or within 1 week of project implementation)
- A Monitoring Plan that (1) provides for measuring turbidity within 72 hours and immediately before offshore construction begins to provide baseline levels and monitoring during offshore construction to ensure the construction operator remains within those levels and (2) identifies the location of a control or reference site so a high turbidity reading caused by a large-scale or regional event is not inappropriately attributed to offshore project construction

APM-3. Spill Prevention and Response Plan. At least 60 days before commencement of offshore construction, a Spill Prevention and Response Plan for all vessels to be used for project activities shall be prepared by Poseidon and submitted for review and approval by California State Lands Commission (CSLC) staff that includes at a minimum the following elements:

- A list of all fuels and hazardous materials that will be used or might be used during offshore construction, along with Material Safety Data Sheets for each material
- Specific protocols for monitoring and minimizing the use of fuel and hazardous materials during offshore construction project operations, including best management practices that will be implemented to ensure minimal impacts to the environment
- An estimate of a reasonable worst case release of fuel or other hazardous materials at the offshore construction project site or into coastal waters resulting from the offshore construction activities
- A list of all spill prevention and response equipment that will be maintained on the vessels performing the offshore construction activities

- The designation of the on-site person with responsibility for implementing the plan
- A detailed response and clean-up plan in the event of a spill or accidental discharge or release of fuel or hazardous materials
- A telephone contact list of all regulatory and trustee agencies, including CSLC and California Coastal Commission staffs, having authority over the development and/or the project site and its resources to be notified in the event of a spill or material release.

APM-4. Workers Educational Training. A worker education training program shall be conducted for workers engaged in offshore construction. The contents of the training program shall be prepared by a qualified biologist approved by California State Lands Commission (CSLC) staff. The program shall include at a minimum the following elements.

- Measures to prevent indirect impacts during construction and maintenance activities shall be covered, including delivery, storage, and use of materials and chemicals as they relate to the protection of aquatic habitat.
- Training materials should include laws and regulations that protect federally-listed species and their habitats, the consequences of non-compliance with laws and regulations and a contact person (i.e., maintenance activity manager) in the event that protected biological resources are affected.
- Training shall take place at the kick-off meeting and any subsequent meetings that may take place if additional contractors are employed during additional maintenance activities. A sign-in sheet will be circulated for signatures to all personnel that attend the workers' educational training to confirm that program materials were received and that they understand information presented.

APM-1 would ensure that appropriate BMPs to protect water quality adjacent to the offshore construction site are implemented. Implementation of **APM-2** would reduce turbidity during screen and diffuser installation by ensuring construction activities remain within maximum allowable waste discharge and turbidity levels as provided by the California Ocean Plan. Implementation of **APM-3** which is subject to review and approval by CSLC staff prior to the start of construction would ensure spill and response equipment is present to minimize any spills that may occur. The plan would also include a detailed response and clean-up plan that would be implemented in the event of a spill or accidental discharge or release of fuel or hazardous materials. **APM-4** would reduce impacts of construction activities on ocean water quality by ensuring that workers are instructed on measures to protect water quality during construction, including the proper delivery, storage, and use of materials and chemicals in aquatic habitats.

Water quality monitoring inside and outside the construction zone would be conducted, if required by the Santa Ana RWQCB as part of a Clean Water Act Section 401 Water Quality Certification. With implementation of the APMs, and given the short duration of the construction timeframe, the small footprint of temporary construction disturbance, and the small number of vessels required for construction activities, impacts to ocean water quality from construction activities would be less than significant.

Mitigation Measures

With implementation of the APMs defined above, construction impacts to water quality would be less than significant. No mitigation measures are required under CEQA.

Impact OWQ/MB-2: Impact to Special Status Species Populations of Intake Screen and Diffuser Installation (Not Including Underwater Noise).

Construction and maintenance of the intake screens and outfall diffuser would temporarily disturb special-status species, if individuals are present; short-term disruption would have negligible effects on affected populations **(Less than Significant)**.

Impact Discussion

As discussed in Impact OWQ/MB-1, construction barges would be temporarily anchored near the intake and outfall structures, dredging would occur to the level of the intake pipeline header, and riprap that surrounds both the intake and discharge pipeline towers would be side-cast, then replaced and extended when construction is complete, thus enlarging the Lease Modification Project's benthic footprint (estimated disturbance is detailed above; see also Figures 2-7b and 2-8b in Section 2, *Project Description*).

Applicant Proposed Measures (APMs)

Poseidon has committed to implement the following APMs to address this impact.

APM-3. Spill Prevention and Response Plan (see Impact OWQ/MB-1)

APM-4. Workers Educational Training (see Impact OWQ/MB-1)

APM-5. Sensitive Marine Species Monitoring and Best Management Practices (BMPs) to Protect Marine Biological Resources. At least 30 days before commencement of offshore construction, Poseidon shall submit a Sensitive Marine Species Monitoring and Mitigation and BMP Implementation Plan for review and approval by California State Lands Commission (CSLC). CSLC may also consult with California Department of Fish and Wildlife (CDFW) staff, California Coastal Commission staff, and other applicable agency staffs in considering the Sensitive Marine Species Monitoring and BMPs. The Plan shall include, at a minimum, the elements below. Poseidon shall write into the contract of each applicable contractor hired to conduct offshore work, including any required in-water pile driving, that all BMPs identified in the Plan shall be implemented. In-water construction activities shall not commence until the Plan has been approved.

- The Plan shall identify the Exclusion/Shutdown and Behavioral Harassment (Impact) Zone for the marine mammals, sea turtles, and special-status marine bird species that may occur in the offshore construction area
- The Plan shall identify measures that will be taken if marine mammals, sea turtles or special-status bird species are within the Impact Zone. These measures may include temporarily halting construction activities until the animal or bird has departed the Impact Zone, as described below.
- The Plan shall list the equipment that marine wildlife monitors (MWMs) will have or

be provided with to effectively monitor marine species (e.g., binoculars, radios or cell phones, log books).

- Poseidon shall provide for approval by CSLC staff the names, qualifications, and roles of three or more MWMs. Selected MWMs shall be able to identify the types and behavior of the marine mammals, sea turtles, and special-status marine bird species that may occur in the offshore construction area.
- Prior to the start of in-water work, MWMs shall be located where they have a clear view of marine waters in the Impact Zone and beyond. MWMs shall be on site and in radio or phone contact with offshore construction personnel at all times in-water construction is conducted. MWMs shall monitor the Impact Zone for 30 minutes before, during, and for 30 minutes after in-water construction activities, including any pile-driving.
- At a minimum, MWMs shall collect the following information daily: (1) general location(s) of MWMs and marine wildlife observations; (2) date/time monitoring begins/ends; (3) activities occurring during each observation period; (4) weather parameters (e.g., percent cover, visibility) and conditions (e.g., sea state); (5) species observed and number of individuals; (6) description of any marine wildlife behavior patterns, including bearing and direction of travel and distance from pile driving activities; (7) other human activity in the area. MWMs shall keep a log book of notes about sightings of marine mammals, special-status birds or sea turtles. Entries in the log shall be made at least hourly, even if the entry is "None observed." Reports shall be emailed or faxed to CSLC staff daily.
- Prior to the start of any pile-driving operations, if a marine mammal or sea turtle is sighted within or approaching the Impact Zone, MWMs shall notify the on-site construction lead (or other authorized individual) to delay pile driving until the animal has moved out of the Impact Zone or the animal has not been re-sighted within 15 minutes (for pinnipeds and small cetaceans) or 30 minutes (for large cetaceans).
- If a marine mammal or sea turtle is sighted within or on a path toward the Impact Zone during any pile driving activities, pile driving shall cease until that animal has moved out of the Impact Zone or 15 minutes (pinnipeds and small cetaceans)/30 minutes (for large cetaceans) has lapsed since the last sighting.
- MWMs shall have authority to temporarily halt in-water project activities if those activities pose a threat to individuals of a special-status species, and to suspend project activities until the animals have left the area. MWMs have the authority to direct cessation (or continuation) of construction activities based on adequate visibility, observed abundance of marine mammals and sea turtles, and their ability to view the Impact Zone. Periodic reevaluation of weather conditions and reassessment of the continuation/cessation recommendation shall be completed by the MWMs.
- Within 30 days of the last day of each offshore work period that requires a MWM on the construction vessel, Poseidon shall submit to CSLC staff a Final Marine Wildlife Monitoring Report and copies of log books prepared by the approved MWMs that include at a minimum:
    - an evaluation of the effectiveness of monitoring protocols/procedures
    - reporting of all marine mammal, sea turtle, and other wildlife sightings (including species and numbers)
    - any wildlife behavioral changes that may be attributed to project construction
    - all project changes (e.g., delays, work stoppages, etc.) due to the presence in

the area of marine wildlife species

- Operators of vessels traveling to the construction site shall maintain a minimum distance of 1,000 feet from whales and sea turtles. Vessels shall not cross directly in front of whales or sea turtles. When paralleling whales, vessels shall operate at a constant speed that is not faster than the whales at a distance less than 1,000 feet. If the whale exhibits evasive, defensive or other adverse behaviors, the vessel shall decrease speed and change direction and increase distance from the whale until the distance is sufficient to reduce stress displayed by the whale.
- Any collisions with marine wildlife shall be reported promptly to CSLC and wildlife agency (National Marine Fisheries Service, CDFW) staffs pursuant to each agency's reporting procedures.
- All daily vessel trips used for construction and maintenance activities will originate from local ports.
- Divers shall not attempt to interact with any marine mammals or sea turtles.

APM-6. Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map. At least 30 days, but not more than 60 days, before the start of offshore construction, Poseidon shall submit an Anchoring, Riprap Reconfiguration, and Dredging Plan for review and approval by California State Lands Commission (CSLC) staff. CSLC staff may also consult with Coastal Commission staff, in considering the Anchoring, Riprap Reconfiguration and Dredging Plan. The Plan shall ensure that impacts on benthic environments are minimized during installation of the wedgewire screens and diffuser, as well as maintenance buoys if required, riprap reconfiguration, and dredging. This Plan shall identify and map Preclusion Areas—all areas of kelp, seagrasses, and hard substrate found within the work area—that shall not be impacted by placement of vessel and buoy anchors, by dragging anchor or buoy lines or cables, by riprap placement, or by dredging spoils during Lease Modification Project construction and maintenance activities. Any surveys subject to the CSLC's Low-Energy Offshore Geophysical Permit Program shall be conducted by CSLC-permitted operators. Within 30 days after completion of offshore construction, Poseidon shall submit to CSLC staff for approval: (1) an "as-built" map overlaying the Preclusion Area Map with Global Positioning System coordinates showing all areas of direct disturbance, anchor and buoy locations, and riprap boundaries, and (2) the procedures Poseidon shall implement to remedy any disturbance that may have occurred within the Preclusion Area due to Poseidon's construction activities.

Anchor placement, dredging, and riprap reconfiguration could crush benthic organisms or result in short-term, temporary displacement. Fish would likely avoid the area during construction and return after activities are completed.~~;~~ Injury or mortality to fish is not expected and displacement would be temporary. Impacts would be less than significant.

As described in Section 4.7, *Noise and Vibration*, construction noise would be temporarily generated approximately 1,500 feet offshore of Huntington State Beach. The worst-case noise levels from combined construction of the intake and discharge modifications would range up to approximately 60 dBA Leq at Huntington State Beach. At this noise level, any disturbance would be temporary and minor; noise impacts to wildlife present onshore, including western snowy plover and California least tern, would be less than significant.

California sea lions are the most common marine mammal species expected to occur in the area. Sea turtles may occasionally be present and whales would rarely be present in the immediate construction area. Marine mammals and sea turtles can avoid demolition and construction impacts by swimming away from the site during construction activities. The potential risk of injury to or mortality of any special-status species from accidental collision with construction vessels or spills would be low, limited due to the short-term (3- to 5-month) construction duration and, if a collision or spill occurred, would not affect the sustainability of any special-status species population.

Pursuant to the above APMs, an oil spill prevention and response plan will minimize any impacts of spills that may occur and a qualified biological monitor would identify special-status species (marine mammals, sea turtles, etc.) if present. If construction activities pose a threat or negative behavioral changes are observed due to construction, activities would be halted. With the APMs, training in species and habitat protection would occur and persons to contact if protected species are affected would be listed. With implementation of **APM-3**, **APM-4** and **APM-5**, construction impacts would be less than significant. Under **APM-6**, Poseidon would complete pre-construction mapping and implement measures to avoid kelp, seagrasses, and hard substrate (if present) during construction and maintenance. This would help to ensure that only benthic resources living on or within the sediments, such as infauna or macroinvertebrates, could potentially be directly impacted during construction and maintenance. With implementation of the above APMs, impacts to marine biological resources from seafloor disturbance during construction would be less than significant.

Mitigation Measures

No mitigation measures are required as no significant impacts were identified for Impact OWQ/MB-2. Regulatory compliance under the processes of the Santa Ana RWQCB, in coordination with the SWRCB pursuant to Desalination Amendment guidance, would also require implementation of a Marine Life Mitigation Plan, to compensate for impacts to benthic habitat from HB Desalination Plant activities.

Impact OWQ/MB-3: Impact to Special Status Species Populations and Movement of Marine Mammal Species as a Result of Underwater Noise during Construction.

Underwater noise, including from **vibratory** pile driving, would temporarily disturb sensitive marine species, including the movement of native resident or migratory marine mammal species, if individuals are present, but short-term disruption would have negligible effects on affected populations **(Less than Significant with Mitigation)**.

Underwater noise from **impact** pile driving would interfere substantially with the movement of native resident or migratory marine mammal species or with established native resident or migratory wildlife corridors **(Significant and Unavoidable)**.

Impact Discussion

Underwater noise would be produced by marine vessels and in-water construction activities, resulting in short-term elevated noise levels near the pipeline ends that may affect marine mammals, sea turtles, sea diving birds, and fishes. Potential impacts of sound and acoustic pressure on marine species, such as behavioral avoidance of the construction area or injury, are discussed below. Section 4.6, *Noise and Vibration*, addresses impacts to community noise-sensitive receptors of construction-related noise through the air.

Source levels between 180 to 190 decibels (dB), in terms of root mean square (RMS)[21] levels referenced to 1 micropascal (µPa) at 1 meter (i.e., 180 to 190 dB_{rms} re 1 µPa), occur from common anthropogenic sources, such as large vessels; smaller workboats and ships have source levels around 160 to 180 dB_{rms} re 1 µPa at 1 meter. Noise from tug and crew boat engines would be similar to that from other vessels that routinely transit the ocean surface, and noise from ship traffic would be comparable to other routine noise-generating activities in the area.

Fundamentals of Underwater Noise. Sound is a physical phenomenon consisting of minute vibrations that travel through a medium such as air or water. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the pitch of a sound and is measured in hertz (hZ) while intensity describes the loudness of a sound (i.e., sound pressure level [SPL]) and is measured in dB, which are measured using a logarithmic scale (e.g., a 10-dB increase represents a 10-fold increase in sound intensity). Sound intensity for underwater applications is typically expressed in dB referenced to 1 µPa). Sound may be measured as either an instantaneous value (in this context peak SPL) or as the total sound energy present in a sound event (i.e., sound exposure level [SEL], a common unit of total sound energy used in acoustics to describe short-duration events). The SEL is the total sound energy in an impulse that accumulates over the duration of that pulse normalized to 1 second, thus the unit for SEL is dB referenced to 1 μPa^2s. Resource agencies use peak SPL and SEL to assess effects of underwater noise on marine species.

Demolition of the intake tower, would be performed by divers using rivet guns and concrete core saws to cut and break up the concrete into manageable-sized pieces (1-week duration). Dredging would remove about 1,000 to 3,300 cubic yards of sediments (1-week duration). Methods similar to dredging would move and replace riprap (10-day duration). Typical dredging levels are lower than or comparable to those from large vessels at 145 to 190 dB_{rms} re 1 µPa (Department for Environment, Food, and Rural Affairs – Centre for Environment, Fisheries & Aquaculture Science 2009; Table 3).

[21] Average of squared pressure over some duration. Instantaneous sound pressures (positive or negative) are squared, averaged, and the square root of the average is taken. For non-pulse sounds, averaging time is any period sufficiently long to permit averaging the variability inherent in the type of sound.

The greatest construction-related noise is expected to occur during the installation of pile foundations at the intake pipeline for the wedgewire screens. Primary factors determining the magnitude of underwater noise levels include:

- Pile driver type: vibratory or impact
- Pile type: Poseidon proposes to install eight to 10 steel H-piles
- Pile size: 12 inches
- Water depth: 33 feet mean lower low water (location of intake pipeline end)

At this time, Poseidon has not selected a pile driving method (impact or vibratory) since the method depends on the geotechnical nature of the sea floor. While vibratory pile driving is Poseidon's preferred method, impact pile driving methods would be used if vibratory pile driving in infeasible. As a result, both pile driving methods are analyzed. Information provided below is based in part on the California Department of Transportation (Caltrans 2015) Compendium of Pile Driving Sound Data, which also contains measured underwater noise levels for various pile types and environments.

Differences between impact and vibratory pile drivers are summarized below.

For vibratory pile driving, a vibrator case is attached to the pile and vibrations are then transferred from the case to the pile using hydraulic, electric, or pneumatic power packs (Warrington 1992; Stuedlein and Meskele 2013) that cause liquefaction and allow the pile to sink downward into the sediment. For this reason, vibratory pile driving is suitable only where soft substrates are present. Vibratory pile driving produces sound energy that is generally 10 to 20 dB lower than impact driving for a particular pile type (Caltrans 2015).	Impact pile driving includes a piston system with weights that are usually raised by a power source (e.g., ignition, hydraulic, steam) then dropped onto the pile in order to drive it into the substrate (Caltrans 2015). Impact pile drivers (impulsive sound sources) usually produce higher sound levels than vibratory pile drivers (non-impulsive, continuous sound sources).

The total energy imparted by vibratory pile driving can be comparable to impact pile driving as the vibratory hammer operates continuously and pile installation requires more time (Washington State Department of Transportation 2010). Since vibratory pile drivers generally produce less sound than impact pile drivers, they are often employed as a mitigation measure to reduce the potential for adverse effects on marine species that can result from impact pile driving (Caltrans 2015).

Estimation of Impact and Vibratory Pile Driving Noise

Pile driving (and generation of underwater pile driving noise) would not be a continuous activity. On days when piles are installed, pile driving would occur for up to 4 hours per day—four piles per day, with driving time taking approximately 15 to 60 minutes for

each 12-inch steel H-pile, plus time between to set up the next pile—and would therefore generate up to 10 hours of underwater noise (for 10 piles) over a 3-day period.

Pile driving noise from similar type and sized piles measured from other projects can be used to estimate Lease Modification Project-generated noise. The analysis in this Supplemental EIR uses sound measurement data from similar projects, obtained from Caltrans (2015), which were reviewed to estimate sound levels for impact and vibratory pile driving. This Supplemental EIR then uses the practical spreading loss model, an accepted method to estimate transmission loss of sound through water (National Marine Fisheries Service [NMFS or NOAA Fisheries] 2012, 2016) to calculate sound levels at various distances from the point of origin. (Measurements are typically taken within 33 feet [10 meters] of a pile during pile driving. As sound spreads through water from the point of origin, it loses intensity [transmission loss]).

Based on underwater measurements for similar steel H-piles, much of the sound energy from impact pile driving ranges between 500 Hz to 1 kilohertz (kHz) and above, diminishing beyond 2 kHz, while for vibratory pile driving, much of the sound energy is contained over the frequency range of 400 Hz to 2.5 kHz (Caltrans 2015). Caltrans (2015; see Tables 1.2-1 and 1.2-2) summarizes data from many projects where impact and vibratory pile driving methods were used.

- For impact pile driving, where one 12-inch steel H-pile was driven at comparable water depths to the Lease Modification Project, average SPLs were 200 dBpeak and 183 dBrms, and the sound exposure level (SEL) was 170 dB (Caltrans 2015; Table 1.2-1).
- For vibratory pile driving, average SPLs were 165 dBpeak and 150 dBrms, and the SEL was 150 dB (Caltrans 2015; Table 1.2-2).

Potential impacts to marine species are dependent on sound source levels and frequencies, animal hearing sensitivity, proximity to the sound source, noise duration, and time of operation. Hearing sensitivities of marine species vary depending upon their anatomy and physiology. For example, some species, such as marine mammals, seem to be more sensitive to the sound pressure component of sound, while some fish appear to be more sensitive to the particle motion component of sound. Additionally, a species' hearing sensitivity to sound also varies depending upon the frequency of the sound, since not all marine species hear equally well at all frequencies.

Potential Effects of Impact Pile Driving Noise on Marine Mammals

NMFS (2016) adopted new Technical Guidance to assess noise impacts on marine mammals with a new method to calculate the onset of permanent threshold shift (PTS), or Level A harassment, for various marine mammal groups based on the groups' hearing characteristics (e.g., high-, mid-, and low-frequency range cetaceans). Table

4.1-1 summarizes marine mammal hearing ranges and PTS onset threshold levels for impulsive (i.e., impact pile driving) and non-impulsive (i.e., vibratory pile driving) sounds.

Table 4.1-1. Summary of Marine Mammal Hearing Ranges and PTS Onset Thresholds[1] (Received Level): Impulsive/Non-Impulsive Noise

		Impulsive		Non-Impulsive
Hearing Group	**Generalized Hearing Range[2]**	**Peak SPL (dB re 1 µPa)**	**Cumulative SEL (dB re 1 µPa²s)**	
Low-Frequency Cetaceans	7 Hz to 35 kHz	219	183	199
Mid-Frequency Cetaceans	150 Hz to 160 kHz	230	185	198
High-Frequency Cetaceans	275 Hz to 160 kHz	202	155	173
Phocids (underwater)	50 Hz to 86 kHz	218	185	201
Otariids (underwater)	60 Hz to 39 kHz	232	203	219

Source: NMFS 2016.
Acronyms: dB = decibel; Hz = Hertz; kHz = kilohertz; PTS = permanent threshold shift; SEL = sound exposure level; SPL = sound pressure level.
Notes:
[1] Dual metric acoustic threshold levels: Use whichever results in the largest isopleth for PTS onset. If a non-impulsive sound may exceed peak SPL thresholds associated with impulsive sounds, these thresholds should also be considered. All cumulative SEL acoustic threshold levels (re 1 µPa²s) incorporate marine mammal auditory weighting functions. Peak SPL thresholds should not be weighted.
[2] Represents the generalized hearing range for all species in the group as a composite, where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for low-frequency cetaceans (Southall et al. 2007) and phocid pinnipeds (approximation).

As shown in Table 4.1-1, acoustic thresholds for impulsive sounds are presented as dual metric acoustic thresholds using cumulative SEL and peak SPL. NMFS (2016) considers the onset of PTS to have occurred when either of the two metrics is exceeded. For non-impulsive sounds, thresholds are provided using the cumulative SEL metric; however, if a non-impulsive sound may exceed peak SPL thresholds associated with impulsive sounds, these thresholds should also be considered.

The NMFS Technical Guidance, however, does not make any changes with respect to the Level B harassment thresholds; therefore, the NMFS previous acoustic threshold for impulsive noise sources (160 dB_{rms}) for impact pile driving and non-impulsive noise sources (120 dB_{rms}) for vibratory pile driving are used. No underwater acoustic thresholds are established for sea otters; in light of experimental evidence, the U.S. Fish and Wildlife Service (USFWS 2017) recently used NMFS's acoustic thresholds for otariid pinnipeds to determine underwater acoustic impacts to sea otters for pile driving in Elkhorn Slough, Monterey County. A similar approach was taken in this analysis.

Table 4.1-2 shows the distances to the PTS (Level A harassment) onset thresholds for marine mammals from impact (impulsive) and vibratory (non-impulsive) pile driving. Marine mammals within these distances (depending upon the type of pile and pile driving method selected) could be adversely impacted and experience non-auditory

physiological effects or injuries such as stress, neurological effects, and different types of organ or tissue damage, which would be considered a significant impact.

Table 4.1-2. Expected Pile Driving Noise Level and Distance of Threshold Exceedance: Impact and Vibratory Pile Driver

	Impulsive				Non-Impulsive	
	Peak SPL[1]		Cumulative SEL[2]		Cumulative SEL[2]	
Hearing Group	**Threshold**	**Distance to Threshold (meters)**	**Threshold**	**Distance to Threshold (meters)**	**Threshold**	**Distance to Threshold (meters)**
Low-Frequency Cetaceans	219	< 1	183	5,910	199	3
Mid-Frequency Cetaceans	230	< 1	185	210	198	< 1
High-Frequency Cetaceans	202	7	155	7,040	173	5
Phocids (underwater)	218	< 1	185	3,160	201	2
Otariids (underwater)	232	< 1	203	230	219	< 1

Acronyms: SEL = sound exposure level; SPL = sound pressure level.
Notes:
[1] Peak SPL = dB re 1 µPa
[2] Cumulative SEL = dB re 1 μPa^2s

As shown in Table 4.1-2, for impact pile driving (impulsive noise), peak SPL thresholds would not be exceeded more than 1 meter from the source for all marine mammal hearing groups except for high-frequency cetaceans, where injurious noise levels may occur up to 7 meters from the pile. However, the distance to the cumulative SEL thresholds for impact pile driving would extend as far as:

- **7,040 meters** from the pile for high-frequency cetaceans
- **5,910 meters** for low-frequency cetaceans
- **3,160 meters** for phocid pinnipeds.

For vibratory pile driving (non-impulsive noise), the cumulative SEL threshold would extend to 5 meters from the pile for high-frequency cetaceans, with all other hearing groups falling within this threshold distance. In an effort to reduce underwater noise resulting for impact pile driving activities, noise reduction methods (e.g., bubble curtains and isolation casings) were explored. Table 4.1-3 shows the distances to the cumulative SEL thresholds for PTS onset using a bubble curtain, isolation casing, and combination of a bubble curtain and isolation casing as possible noise reduction methods.

As shown in Table 4.1-3, even with the combined use of a bubble curtain and isolation casing, cumulative SEL thresholds would extend to

- **1,520 meters** from the pile for high-frequency cetaceans
- **1,275 meters** for low-frequency cetaceans
- **680 meters** for phocid pinnipeds

Table 4.1-3. Expected Pile Driving Noise Level and Distance of Threshold Exceedance: Impact Pile Driver and Noise Reduction Methods

			Distance to Cumulative SEL Threshold with Noise Reduction Methods		
Hearing Group	**Cumulative SEL Threshold (dB re 1 µPa^{2}s)**	**Distance to Threshold (meters)**	**Bubble Curtain (meters)**	**Isolation Casing (meters)**	**Bubble Curtain and Isolation Casing (meters)**
Low-Frequency Cetaceans	183	5,910	2,740	2,740	1,275
Mid-Frequency Cetaceans	185	210	100	100	45
High-Frequency Cetaceans	155	7,040	3,270	3,270	1,520
Phocids (underwater)	185	3,160	1,470	1,470	680
Otariids (underwater)	203	230	110	110	50

As a result, marine mammals within the distances shown above could be adversely impacted and experience non-auditory physiological effects or injuries. Implementation of **MM OWQ/MB-3a: Vibratory Pile Driving** would substantially reduce the distances at which marine mammals may experience potentially injurious noise levels resulting from pile driving.

MM OWQ/MB-3a: Vibratory Pile Driving. Installation of the 12-inch steel H-piles for the wedgewire screens shall use a vibratory hammer to reduce the peak noise levels. If site-specific geotechnical studies show that vibratory pile driving cannot be used and impact pile driving is required, Poseidon shall obtain California State Lands Commission ~~staff~~ approval for the use of impact pile driving.

For vibratory pile driving, the maximum distance at which the cumulative SEL threshold is exceed for marine mammal hearing groups is 5 meters (for high-frequency cetaceans). However, per NMFS 2016 Technical Guidance document, if a non-impulsive sound may exceed peak SPL thresholds associated with impulsive sounds, these thresholds should also be considered. This is only true for high-frequency cetaceans, where the distance to the peak SPL threshold (7 meters) exceeds the distance to the cumulative SEL threshold (5 meters). For all other marine mammal hearing groups, the distances to the cumulative SEL threshold are greater than or equal to the distances to the peak SPL threshold. As a result, marine mammals may experience injurious noise levels within the following distances from the pile:

- **7 meters** for high-frequency cetaceans
- **<1 meter** for mid-frequency cetaceans
- **5 meters** for low-frequency cetaceans
- **2 meters** for phocid pinnipeds
- **<1 meter** for otariid pinnipeds.

Pile driving activities may also affect marine mammal behavior, including avoidance of the Lease Modification Project area during elevated noise levels. As stated above, the NMFS Technical Guidance document did not make any changes with respect to the

Level B harassment thresholds; therefore, the 120 dB_{rms} threshold for non-impulsive noise was used. Using a vibratory pile driver, marine mammals may experience behavioral harassment up to **1,000 meters** from the pile. While noise levels at these distances would not cause injury to marine mammals, they may temporarily affect their behavior, causing them to avoid the area during pile driving activities.

The annual migration of gray whales is up to 13,000 miles round trip, between their sub-Arctic feeding grounds near Alaska and the warm waters of coastal southern California and the lagoons of Baja California where they give birth and breed (Allen et al. 2011). Gray whales are the only truly coastal species among the baleen whales. They are rarely found more than 6 miles offshore except when migrating around islands. Some gray whales may not migrate every year, and may reside and give birth near the Channel Islands, as well as in well-known calving locations such as coastal lagoons in Baja California.

Because of their nearshore distribution, gray whales are not well surveyed by large oceanographic ships or offshore aerial surveys. In contrast, long-term visual surveys from shore near La Jolla and off the Palos Verdes peninsula provide a record of the timing of migrations and the abundance of whales seen from shore. For example, the Los Angeles chapter of the American Cetacean Society has collected data on gray whales offshore Palos Verdes, approximately 25 miles northwest of Huntington Beach, for more than 33 consecutive years. From December 1, 2015, through May 31, 2016 (http://www.acs-la.org/census16-long.htm), cliff-top observers near Palos Verdes saw 1,430 southbound and 2,541 northbound gray whales. Southbound whales tend to be farther offshore and less likely to be spotted, while northbound whales, especially cow and calf pairs, hug the shoreline and swim more slowly, making them more readily seen. In 2016, off Palos Verdes, southbound gray whale numbers peaked at 229 the week of January 24 to January 30, and northbound whale numbers peaked at 531 the week of February 28 to March 5. During the 2015/2016 migration season, there was an extended overlap between southward and northward migrants, with 105 northward migrants during the “southern” migration and 81 southward migrants during the “northern” migration. The peak weeks for cow and calf pairs migrating north were 78 pairs from April 18 to 24, and 85 pairs from May 5 to May 11. (See excerpt below from Gray Whale Census and Behavior Project: 2015-2016.)

Excerpted from www.acs-la.org/census16-long.htm.
ACS/LA GRAY WHALE CENSUS AND BEHAVIOR PROJECT: 2015-2016
For daily sighting details, please visit: www.acs-la.org

GRAY WHALE COUNTS ROSE: We spotted 1,430 southbound and 2,541 northbound gray whales (1,902 southbound and 2,141 northbound gray whales last season). This was our second highest southbound count (exceeded only by last season), and our fourth highest northbound count (highest in 30 seasons). Whale counts have widely fluctuated over 32 previous seasons: southbound counts varied from 301-1,301, and northbound counts varied from 521-3,412. Although most of the ~21,000 gray whales migrate past California, we spot only a small proportion. Gray whales, especially adults, off Palos Verdes tend to travel further offshore - notably during the southbound migration. Northbound whales, particularly cow/calf pairs, tend to hug the coastline. These trends, combined with extended springtime observation hours, produce higher northbound counts. Shifting migratory corridors and weather conditions result in annually fluctuating shore-based counts. The number of whales that complete the migration varies, and feeding ground conditions (especially ice coverage) affect migratory timing and corridors. Poor visibility drastically affects counts; fog compromised our visibility during portions of a few more days this season (61) as last season (55).

PEAKS AND TURN-AROUND DATES: For the fifth consecutive season, our southbound migration started early. The peak southbound counts were 57 on 26 January, and 55 on 6 February; our previous peak counts ranged from 15-98. We spotted 226 southbound whales during the peak southbound week of 24-30 January (259 last season, same week). Instead of the typical gap, we again had a rare extended overlap between migration phases. The official turn-around date (when daily northbound whales exceed southbound whales) was on 17 February. We spotted 105 northbound whales during the “southbound migration,” and 81 southbound whales during the “northbound migration.” Our peak northbound counts were 96 grays on 8 March, and 90 on 4 March. Previous northbound peaks counts ranged from 20-152. We recorded 531 gray whales during the peak northbound week (main migration pulse) of 28 Feb-5 March (395 last season).

CALF COUNTS:- A CALF IS BORN, AND RECORD NORTHBOUND COUNTS! We spotted 33 newborn southbound calves (2.3% of southbound migrants) between 2 January-14 February, including one that was born in our viewing area on 26 January! Last season we saw 50 newborn calves, which was 2.6 % of the southbound migrants. Our record high southbound calf count occurred during the 1997-98 season (106 calves, 8.6% of southbound migrants). Previous southbound calf counts ranged from 3-60 (0.5%-8.9% of southbound migrants), with the lowest percentage (0.5%) in 1988-1989. We tallied a record 341 northbound calves (13.4% of northbound migrants), between 9 April-22 May, peaking with 20 calves on 22 April. This surpassed last season's record northbound calf count: 318 northbound calves (14.9% of northbound migrants). Previous record calf counts included 260 northbound calves (22.9% of northbound migrants) in 2011-2012, and 222 calves (13.8% of northbound migrants) in 1996-97. Our other calf counts have ranged from 11-196 (0.9%-18.5% of northbound migrants). We recorded 85 cow/calf pairs (177 gray whales) between 5-11 May, and 78 cow/calf pairs (168 gray whales) between 18-24 April. These were our peak northbound weeks (cow/calf migration pulse); this pulse peaks 4-8 weeks later that the main pulse, which allows calves to nurse longer and strengthen swimming skills in Baja lagoons before initiating their perilous migration northward….

Gray whales are known to occur close to shore where steep topography brings deep water close to shore, but also in shallow water where mothers guide their young calves on northern migrations. Mothers can guide their calves within 0.75 mile of the shoreline, sometimes through kelp and among surfers at the surf line. Broad patterns of seasonal occurrence are present with peaks in mid-January and mid-March through May. However, gray whales that do not migrate have been noted recently (e.g., in the Channel Islands). The presence of gray whales cannot be ruled out at any time of year, but the least likely time of occurrence near the Lease Modification Project area would be from mid-June to late November. In addition, cow and calf pairs, which are typically found in their northern feeding grounds at this time, would not be expected to occur near the Lease Modification Project area during a June to November timeframe.

In the Southern California Bight at water depths of 5 to 30 meters, temperatures are seasonally warmest in late August through September and wind speeds are the lowest from July through September (Gelpi and Norris 2008). These conditions would be favorable for offshore construction and gray whale acoustic impacts would be minimized at this time of the year.

Poseidon will implement **APM-5**, which provides for sensitive species monitoring and use of BMPs (see Impact OWQ/MB-2). However, implementation of **MM OWQ/MB-3b:** and **MM OWQ/MB-3c** are also needed. Implementation of MM OWQ/MB-3b would substantially reduce the likelihood of causing potentially significant impacts to migratory gray whales in the Lease Modification Project area during vibratory or impact pile driving activities. Implementation of MM OWQ/MB-3c would result in the gradual increase of pile driving noise, which may reduce the chance that a marine mammal would be startled by a change in the noise field and allow the animal to potentially move further from the sound source.

MM OWQ/MB-3b: Pile Driving Work Windows. Pile driving shall only occur between June and November to avoid potential impacts to gray whale migrations in this region. The California State Lands Commission Executive Officer or designee, following consultation with California Coastal Commission and California Department of Fish and Wildlife staffs, may adjust the work window based on changes made during National Marine Fisheries Service (NMFS) consultation. In-water pile driving shall not occur between 30 minutes before sunset and 30 minutes after sunrise.

MM OWQ/MB-3c: Soft Start. A soft start for pile driving requires contractors to initiate the driver at a reduced energy for 15 seconds followed by a 30-second waiting period; this procedure is then repeated two additional times. A soft start shall be implemented before pile driving begins each day and any time following the cessation of pile driving for 30 minutes or longer.

Given the temporary use of pile driving, and implementation of APM-5 and the mitigation measures identified above, impacts to marine mammals, if present in the

Lease Modification Project area, would be avoided or mitigated to less than significant for vibratory pile driving. If impact pile driving is deemed necessary, the residual impacts would remain significant and unavoidable.

Potential Effects of Impact Pile Driving Noise on Sea Turtles

Very few hearing studies have involved sea turtles (Popper et al. 2014). Sea turtles appear to be sensitive to low-frequency sounds with a functional hearing range of about 100 Hz to 1.1 kHz (Ridgway et al. 1969; Bartol et al. 1999; Ketten and Bartol 2006; Martin et al. 2012). It has been suggested that sea turtle hearing thresholds should be equivalent to Level B harassment thresholds for low-frequency cetaceans (Southall et al. 2007; Finneran and Jenkins 2012); however, the Acoustical Society of America standards committee suggests that turtle hearing is probably more like fish than marine mammals (Popper et al. 2014). For this analysis, sea turtles were presumed to have the same thresholds as fish with swim bladders not involved in hearing. Thus, sea turtle mortality and mortal injury would be expected at pile driving sound levels greater than a cumulative SEL threshold of 210 dB and peak SPL threshold of 207 dB_{peak}. In the absence of behavioral impact thresholds, NMFS's Level B harassment thresholds for impulsive (160 dB_{rms}) and non-impulsive (120 dB_{rms}) were used.

The distance calculations to these thresholds indicate that the peak SPL of 207 dB_{peak} would be exceeded within 3.5 meters, while the cumulative SEL of 210 dB would be exceeded within 13 meters of the pile being driven. For behavioral disturbance, the 160 dB_{rms} threshold for impulsive noise (impact pile driving) would be exceeded within 350 meters, while the 120 dB_{rms} threshold for non-impulsive noise (vibratory pile driving) would be exceeded within 1,000 meters of the pile being driven. As a result, sea turtles within 13 meters of the source may experience may experience mortality or mortal injury, whereas sea turtles may experience behavioral harassment out to 350 meters for impact pile driving and out to 1,000 meters for vibratory pile driving.

Sound level and duration of exposure are likely important components for sea turtles, which are slow swimmers and take longer to leave an area. Leatherback and loggerhead sea turtles are endangered species, and green and olive ridley sea turtles are threatened species, so extra precautions and potential mitigation are warranted if they enter the area; however, the likelihood of these species being in the Lease Modification Project area is very low. Some potential responses of sea turtles to human-made sounds include increased surface time, decreased foraging, displacement, and startle reactions. Given the temporary use of pile driving, and implementation of the mitigation measures identified above, impacts to sea turtles, if present in the Lease Modification Project area, would be avoided or mitigated to less than significant.

Potential Effects of Impact Pile Driving Noise on Fish

In 2008, the Fisheries Hydroacoustic Working Group (FHWG) issued interim threshold criteria based on the best available science for the onset of injury to fish from noise generated during impact pile driving (FHWG 2008; see Table 4.1-4).[22] The FHWG determined that noise at or above the 206 dBpeak SPL threshold, which applies to fish smaller than or greater than or equal to 2 grams, can cause barotrauma to auditory tissues, the swim bladder, or other sensitive organs. Noise levels above the 183 dB (for fish less than 2 grams) or 187 dB (for fish greater than or equal to 2 grams) cumulative SEL may cause temporary hearing thresholds shifts in fish.

Table 4.1-4. Interim Thresholds for Onset of Injury in Fish from Impulsive Noise

	Peak SPL (dB re 1 µPa)	Cumulative SEL (dB re 1 µPa^{2}s)
Less than 2 grams	206	183
Greater than or equal to 2 grams	206	187

Source: FHWG 2008.
Acronyms: dB = decibel; SEL = sound exposure level; SPL = sound pressure level.
Note: There are no formal criteria for continuous noise. The impulse noise thresholds are commonly applied for continuous noise in the absence of a specific threshold.

These criteria were developed for impact pile driving (there are no established criteria for vibratory pile drivers), thus this analysis uses interim criteria for impact pile driving for onset of injury. Behavioral effects (e.g., fleeing the area or temporary cessation of feeding or spawning behavior) are not covered under these criteria; however, NMFS considers underwater noise above 150 dBrms to potentially cause temporary behavioral changes (startle and stress). Although not formal standards, these criteria are generally accepted to evaluate injury potential to fish from impact pile driving.

The spreadsheet developed by NMFS (2012) was used to estimate the potential impact from underwater pile driving noise to fish. This spreadsheet uses sound pressure input data for the specific pile type and driving method. For the Lease Modification Project, input data are based on measured underwater noise level data from 12-inch steel H-piles driven by impact hammers and vibratory hammers (Caltrans 2015). The NMFS spreadsheet calculates the estimated horizontal distance from the pile driving site to the threshold levels. Table 4.1-5 summarizes noise analysis results for fish. Fish species within these distances (depending on the method of pile driving and pile type used) could be adversely impacted; however, no fish species found in the Lease Modification Project area are listed as special-status species.

Fishes are particularly sensitive to high sound levels since they can detect sound pressure and particle motion. In general, fishes close to a loud or prolonged sound

[22] Members of the FHWG include: NMFS's Southwest and Northwest Divisions; California, Washington, and Oregon Departments of Transportation; CDFW; and U.S. Federal Highway Administration.

source may be killed, or may experience hearing loss, non-auditory tissue damage, or non-fatal responses including changes in swimming behavior, water column position or schooling patterns, or startle responses, area evacuation, or freezing in place reaction.

Table 4.1-5. Expected Pile Driving Noise Level and Distance of Criteria Level Exceedance (Fish)

			Impact Driver	Vibratory Driver
Maximum Source Levels (dB)	Peak Noise Level		200 dB	165 dB
	Sound Exposure Level (SEL), single strike[3]		170 dB	150 dB
	Sound Exposure Level (SEL), accumulated		212 dB	192 dB
	Root Mean Square (RMS) Noise Level		183 dB	150 dB
Distance to Threshold (meters) [1,2]	Peak threshold of 206 dB_{peak}		4	NE
	Cumulative SEL threshold	187 dB for fish weighing ≥ 2 grams	435	20
		183 dB for fish weighing < 2 grams	800	40
	NMFS behavioral threshold of 150 dB_{rms}		1585	10

Acronyms: dB = decibels; m = meters; NE = threshold not exceeded.
Notes:
[1] The distance from the pile over which the effects thresholds would be exceeded.
[2] Calculations based on 12-inch steel H-pile (unattenuated) (4 per day).
[3] For vibratory driving, the single strike SEL represents the SEL of 1 second of pile driving.

Temporary avoidance of the area may occur during pile driving; however, once temporary pile driving noise ceases, fish can resume normal behaviors. Given the short-term use of pile driving (approximately 3 days total), the potential for acoustic-related impacts to fish would be less than significant.

Potential Effects of Impact Pile Driving Noise on Diving Seabirds

Pile driving activities would occur 1,650 feet offshore and would not occur near roosting or nesting habitat for sensitive bird species; therefore, only underwater noise impacts to seabirds are evaluated. Diving seabirds include those that make shallow plunges from the water surface down to depths of 3 feet (1 meter), make aerial plunges from various altitudes to depths of several feet, or dive to depths of tens of feet or more to feed.

Only extremely limited information exists on diving seabird sensitivity to sound underwater. Additionally, there are no underwater acoustic guidelines for diving seabirds. The U.S. Navy (2011) convened the Marbled Murrelet Science Panel to examine potential impacts to the marbled murrelet due to underwater noise. While the marbled murrelet is not found in the Lease Modification Project area, the impacts to this diving bird are a conservative correlation to the birds in the area as it is a smaller bird than the cormorants, and noise impacts are generally a function of bird weight. The Panel discussed a range of potential threshold levels between 183 and 206 dBA. Although noise impacts to birds would vary by species, this threshold would be generally applicable to other similarly sized seabirds (e.g., California least tern).

Behavioral changes in seabird activity in-water would most likely indirectly correlate to behavioral changes in fish, as the birds are diving to pursue fish species.

Diving seabirds are especially vulnerable approaching a sound source not only because birds have higher thresholds of hearing (i.e., less sensitive hearing) than humans, but also because the sound-reflecting nature of the air-sea interface tends to trap waterborne sounds beneath the sea surface. Seabirds on the water or diving in the area may be exposed to the maximum sound energy from pile driving activities. Near a pile driving site off Point Loma, California, least tern counts were lower on days with pile driving compared to days without pile driving (Naval Facilities Engineering Command Southwest [NAVFAC SW] 2014). Potential indicators of behavioral stresses due to noise on birds may include a startle response, difficulty detecting prey or predators, masking of communication sounds, physical displacement, and changing breeding or nesting sight locations.

Awareness of seabird species and their responses is especially important since some diving seabirds in the area (e.g., the California least tern, which is a state- and federally-listed endangered species) may feed in waters near the Lease Modification Project site. Based on NMFS spreadsheet tools and acoustic calculations, using the nearshore projects simplified attenuation formula applicable to shallow and nearshore waters (NMFS 2016) with an attenuation rate of 5 dB/10 meters, distances to the potential threshold range for impact pile driving would be 4 m (206 dBA) and 135 m (183 dBA); these thresholds would not be exceeded using the vibratory pile driving method.

Since the duration of underwater sound exposure for diving birds is expected to be short, impacts resulting from pile driving are unlikely. As suggested by Minerals Management Service (MMS; now Bureau of Ocean Energy Management [BOEM]) in a 2006 Biological Evaluation, the “soft start” (**MM OWQ/MB-3c**) process may cause seabirds to disperse and avoid the area preventing more direct effects (MMS 2006). Seabirds in general relocate to areas where they are not bothered by physical or noise disturbance, and then continue with their foraging, roosting, and other activities. Given the information above and the temporary use of pile driving, this impact is considered less than significant.

Results of Previous Analyses–Construction (SWRCB 2015a)

SWRCB (2015a) identified several desalination projects with proposed mitigation measures to avoid or reduce potential impacts to fish, invertebrates, and marine mammals associated with underwater pile-driving noise during construction.

- Marin Municipal Water District (2008). Mitigation measures for pile driving noise during reconstruction of a pier extending into the bay, included consultation with NOAA Fisheries to identify seasonal work windows for those species at risk, using avoidance technology (e.g., bubble curtains), and monitoring for dead or

injured fish during these activities. With mitigation these impacts were determined to be less than significant. For marine mammals, pile driving may require an Incidental Harassment Authorization or Incidental Take Authorization from NOAA Fisheries if noise exceeds specific standards. Use of monitoring was also identified to avoid impactful activities when marine mammals are present. (SWRCB 2015a)

- City of Santa Cruz and Soquel Creek Water District (2013). Mitigation proposed included monitoring underwater noise, installation of bubble curtains to reduce noise below ecological thresholds and avoiding noise generating activities if marine mammals are present within an exclusion zone. (SWRCB 2015a)

Applicant Proposed Measures (APMs)

Implementation of **APM-5,** Sensitive Marine Species Monitoring and Best Management Practices (BMPs) to Protect Marine Biological Resources (see Impact OWQ/MB-2) would address this impact by providing some protection to marine mammals and other species likely to be affected by underwater noise, through procedures that include monitoring and the ability to halt construction activities if negative behavioral changes to marine mammals, sea turtles, or other special status species are observed during construction. Any marine mammals near the construction work areas during noise-generating activities would likely avoid or move away from the construction work areas. Individuals may temporarily avoid the area, but adverse effects to populations would not be discernable.

Mitigation Measures

Even with the implementation of APM-5, the following additional mitigation measures would need to be implemented to reduce potential significant effects to marine biological resources associated with pile-driving activities.

MM OWQ/MB-3a: Vibratory Pile Driving

MM OWQ/MB-3b: Pile Driving Work Windows

MM OWQ/MB-3c: Soft Start

Residual Impacts

Implementation of the above measures would reduce impacts to marine mammals to temporary and behavioral effects, and impacts would be considered less than significant if vibratory pile driving is used to drive the piles that would support the wedgewire screens. However, if vibratory pile driving is deemed infeasible, the impacts from impact pile driving would remain significant and unavoidable.

Impact OWQ/MB-4: Spread of Invasive and Non-Native Marine Species in the Ocean.

Lease Modification Project construction ~~and operation~~ vessels could introduce invasive non-native species. **(Less than Significant with Mitigation)**

Impact Discussion

Installation of the intake and diffuser modifications would require use of a derrick barge, tugboat, utility vessel, and crew and monitoring boats, two sets of vessels if both the screens and diffusers are installed at the same time. Marine vessels used for the Lease Modification Project are assumed to travel between the construction site and the POLB or closer port (e.g., Newport Beach or Los Alamitos).

Many invasive, non-native species are introduced by boat traffic, either as encrusting organisms on the hulls and other submerged parts of vessels, or when ballast water is discharged from vessels. The introduction of such species can cause permanent changes in the community composition or ecosystem relationships among species that are recognized for scientific, recreational, ecological, or commercial importance, and permanent alteration of habitat that precludes reestablishment of native biological populations. Ports and harbors and adjacent areas are typically most vulnerable to invasive species, as the bulk of marine traffic is concentrated at these sites. The POLB is proposed as a location for construction vessel traffic and for transporting any excess soil or riprap. If invasive species are resident within these harbor facilities, these species may be transported to the Lease Modification Project site during transit. Construction vessels would be the primary and most likely vector for introducing invasive and non-native marine species.

Although transfer is unlikely as (1) the daily vessels are not expected to remain within the harbor for a sufficient length of time for invasive species to establish on the hulls and (2) ballast water discharge and recharge are strictly controlled within major harbors for large vessels, the Lease Modification Project barges and utility vessels could spread invasive non-native marine species through ballast water and biofouling.

Mitigation Measures

In order to reduce potentially significant impacts resulting from the spread of invasive non-native species, implementation of the following mitigation measure would minimize the Lease Modification Project's potential contribution to the spread of invasive non-native species and any resulting adverse impact on marine biological resources. With implementation of **MM OWQ/MB-4**, the impacts related to the spread of invasive and non-native marine species would be reduced to a less-than-significant level.

MM OWQ/MB-4: Prevent Introduction of Invasive Non-Native Species. All Lease Modification Project barges and tugs shall: (1) originate from the Ports of Long

Beach/Los Angeles (POLB/POLA); (2) be continuously based out of POLB/POLA since last dry docking; or (3) have underwater surfaces cleaned before entering southern California at vessel origination point and immediately prior to transiting to the Lease Modification Project site. Additionally, and regardless of vessel size, ballast water for all Lease Modification Project vessels must be managed consistent with California State Lands Commission (CSLC) ballast management regulations, and Biofouling Removal and Hull Husbandry Reporting Forms shall be submitted to CSLC staff. Lease Modification Project vessels shall also be available for inspection by CSLC staff for compliance.

4.1.4.2 Operation Impacts

Impact OWQ/MB-5: Impact to Ocean Water Quality from Wedgewire Screen and Diffuser Operation and Maintenance

Placement of wedgewire screens composed of ~~copper-nickel alloy~~ stainless steel ~~may~~ would not result in chemical leaching into the water column. **(~~Significant and Unavoidable~~ Less than Significant)**

Discharges of HB Desalination Plant effluent through the multiport diffuser would be installed to comply with 2015 Ocean Plan standards for salinity and other discharge constituents. **(Less than Significant).**

Maintenance would be conducted using APMs for turbidity minimization, spill response planning, and worker training. **(Less than Significant).**

Impact Discussion

Wedgewire Screen Operation

Withdrawing seawater through stainless steel wedgewire screens would not affect ocean water quality. ~~However,~~ Poseidon now proposes to install wedgewire screens with mesh composed of a ~~copper-nickel alloy~~ high-grade stainless steel as stainless steel has better corrosion resistance in saline water than other metals.~~, which~~ Although some studies have shown screens fabricated of copper-nickel alloy provide~~s~~ the greatest resistance to biofouling (SWRCB 2015b), ~~but that~~ they also corrode~~s~~ more easily~~. C~~, and the copper ~~from these screens~~ may leach into the water column, resulting in degraded water quality and potentially adversely affecting marine organisms. The increase in biofouling potential of stainless steel screens may require more frequent maintenance than for copper-alloy screens (estimated every other month). Pursuant to **APM-8**, Composition and Maintenance of Wedgewire Screens, Poseidon would install stationary copper-nickel alloy wedgewire screens only if future data show, to the satisfaction of Commission, Water Boards, and Coastal Commission staffs, that there are no significant adverse environmental impacts associated with copper leaching that would violate Ocean Plan Water Quality Objectives. Future installation of copper screens would require a determination of no significant adverse

environmental impacts associated with copper leaching in violation of Ocean Plan Water Quality Objectives because ~~H~~high copper levels in the ocean have been found to reduce the abundance of plankton, acidians, and echinoderms (SWRCB 2015b).

Use of copper-alloy screens is analyzed as a Lease Modification Project alternative in Section 5.4.3, *Copper-Nickel Alloy Stationary Wedgewire Screens*. The release of copper is a complex process influenced by: diffusion from the solid surface, dissociation of the copper oxide, leaching into seawater, dispersion by currents, flocculation, and burial in sediments. According to Michel et al. (2011), leaching levels from direct surface measurements of solid copper-nickel have not been extensively evaluated. ~~In the absence of an available suitable standard to assess copper releases from solid copper-nickel screens, the impact to ocean water quality from wedgewire screen leaching cannot be quantified or assessed, and could be potentially significant.~~

Ocean Plan Water Quality Objectives for Protection of Marine Life limit copper to a 6-month median of 3 micrograms per liter (µg/L), a daily maximum of 12 µg/L, and an instantaneous maximum of 30 µg/L (SWRCB 2015b). Installation of copper-nickel alloy screens would likely trigger Ocean Plan requirements related to copper leaching, including toxicity testing requirements and compulsory sampling and analyses to determine compliance with effluent limitations. ~~If wedgewire screens with mesh composed of a copper-nickel alloy were placed into the ocean, no mitigation measures are available to reduce potentially significant impacts to ocean water quality resulting from copper leaching. If chemical leaching exceeds Ocean Plan Water Quality Objectives, this impact would be potentially significant and unavoidable. An alternative to installing wedgewire screens with copper-nickel mesh is discussed in Section 5, *Alternatives*.~~

Multiport Diffuser Operation

In its 2010 approval, the CSLC adopted a finding that the 2010 Project's concentrated seawater discharge will not significantly impact ocean water quality or marine biological resources in the area. Operation of the diffuser on the discharge pipeline would further act to dilute concentrated brine and other effluent discharged from the desalination plant. With respect to ocean water quality, the diffuser would be designed, as required by the Desalination Amendment, to maximize dilution to natural salinity plus 2 ppt, minimize the size of the BMZ, and minimize the suspension of benthic sediments. Brine dilution under co-located and stand-alone operating scenarios would occur as follows.

- **Brine Dilution (Co-Located Operation).** Under co-located operation, the cooling water flow of the HBGS is anticipated to be up to 127 MGD. During co-located operation of the HB Desalination Plant, the desalination process removes a net of 50 MGD from the flow system, leaving up to 77 MGD or 119 cubic feet per second (cfs) to be discharged back to the ocean. This 50 MGD net flow removal is the result of withdrawing about 106.7 MGD, removing the salt from 50

MGD for distribution, and returning about 56.7 MGD (about 87 cfs) to the system with almost twice the initial ocean salinity. Because 6 MGD is used for backwash and is not increased in salinity, the initial ocean salinity of 33.5 ppt is increased to about 63.1 ppt in the 56.7 MGD brine discharge. For co-located operation, the brine would mix with the remaining HBGS flow in the discharge tunnel and would be further diluted by the proposed diffuser. The mixed concentration in the discharge tunnel with 77 MGD is about 55.3 ppt (Alden 2017a).

- **Brine Dilution (Stand-Alone Operation).** For the stand-alone operating condition, the HB Desalination Plant would have an average annual withdraw of approximately 106.7 MGD. The brine discharge would be about 56.7 MGD (87 cfs) at a salt concentration of about 63.1 ppt (Alden 2017a).

Michael Baker International (MBI 2017a) performed a dilution analysis and determined that during stand-alone operation:

- The proposed duckbill diffuser would dilute the brine to within 2 ppt of natural background at 79.7 feet (24.3 meters) from the point of discharge.
- Mixing and dilution increase with distance from the discharge diffuser, such that salinity would be reduced to ~~34.5~~35.5 ppt (natural salinity plus 2 ppt) at approximately 80 feet from the discharge port (MBI 2017).

MBI (2017b) modeled the projected "worst-case" maximum discharge conditions over an entire month and calculated that the proposed duckbill diffuser would dilute the brine to within 2 ppt of natural background at distances between 13.1 and 18 feet (4 and 5.5 meters) from the point of discharge. The modeling has not been peer-reviewed to date.

The Desalination Amendment requires that salinity of the brine and seawater mixture must be no more than natural salinity plus 2 ppt at a distance of 328 feet from its discharge. Stand-alone discharge from the Lease Modification Project would meet the water quality requirement for salinity, resulting in a less than significant impact.

Maintenance

Maintenance of the wedgewire screened intake would entail~~: 1)~~ periodic manual cleaning by divers (most likely occurring during regularly-scheduled inspections)~~, 2) an onshore-based air burst system, or 3)~~ and a boat-based air-burst system (see Section 2.4.6.2, *Screen Maintenance*). Both the periodic manual diver cleaning and the boat-based air burst system options, in addition to the periodic manual cleaning of the diffuser by divers, would require use of vessels and result in disturbance to the seafloor, which have the potential to affect ocean water quality and potentially marine biological resources.

~~If a~~ A boat-based air burst system ~~is~~ would be used to clean the wedgewire screens after installation, and therefore gravity anchor blocks would be placed on the seafloor to keep the boat on station (see Figure 2-11 in Section 2, *Project Description*). A barge-mounted crane would install the gravity anchors during wedgewire screen installation ~~if the decision is made to implement the boat-based air burst system (if and when manual diver cleaning is deemed to be ineffective)~~. Placing anchors on the seafloor could result in decreased water clarity levels as anchor lines are dragged across sand as well as crush any benthic organisms located where the blocks are placed.

Other potential impacts during maintenance may include fuel or oil spills from the boats; each maintenance event would last for a shorter duration than construction activities with similar impacts, but would occur over the life of the HB Desalination Plant. Such impacts, however, would be less than significant with the implementation of **APM-1**, Offshore Construction Best Management Practices (BMPs) to Protect Water Quality, and **APM-2**, Turbidity Minimization and Monitoring Plan.

Applicant Proposed Measures

~~Poseidon has not proposed any APMs to address copper leaching if copper screens are used.~~ Implementation of the following APMs would protect ocean water quality associated with general operation and maintenance.

APM-1. Offshore Construction Best Management Practices (BMPs) to Protect Water Quality

APM-2. Turbidity Minimization and Monitoring Plan

APM-8. Composition and Maintenance of Wedgewire Screens

Mitigation Measures

~~There are no feasible mitigation measures to reduce potential significant effects to ocean water quality associated with the operation of copper wedgewire screens.~~ With the implementation of **APM-1**, ~~and~~ **APM-2**, and **APM-8**, no mitigation measures are required to address the remaining less-than-significant impacts associated with wedgewire screen and diffuser operation or Lease Modification Project maintenance.

~~**Residual Impacts**~~

~~Even with implementation of the above APMs to reduce impacts to ocean water quality, if chemical leaching from copper wedgewire screens (if used) exceeds Ocean Plan Water Quality Objectives for copper then the impact would remain significant and unavoidable.~~

Impact OWQ/MB-6: Impact to Special Status Species Populations of Intake Flow Reduction (Compared to 2010 Project) and Use and Maintenance of Wedgewire Screens

Compared to 2010 Project-approved operations, reducing the volume of seawater intake for stand-alone operations and adding screens to the intake pipeline would reduce numbers of special status species impinged and entrained through the seawater intake and have negligible effects on special status species populations **(Less than Significant**).

Impact Discussion

Drawing in a reduced average volume of seawater through the intake pipeline wedgewire screens would reduce mortality of marine life caused by impingement (when marine organisms are trapped against intake screens) or entrainment (when smaller organisms [e.g., fish larvae] are drawn through the intake screens and into the HB Desalination Plant) compared to the HB Desalination Plant operational impacts analyzed in the 2010 FSEIR. The 2010 FSEIR evaluated the use of the existing HBGS open ocean intake and the existing HBGS discharge structure, which has no velocity cap or diffuser. The 2010 FSEIR (Section 4.10, Marine Biology Impacts, Impingement and Entrainment, Stand-alone Operation – Entrainment) concluded the following with respect to entrainment:

> *Larval entrainment losses due to operation of the project in the stand alone operating condition are projected to affect only a small fraction of the larvae (0.02−0.33%) of the source water populations of approximately 115,000,000,000 ([115] billion) individual larval fish at risk to entrainment, that occur within the project's source water. The impingement mortality and entrainment studies at HBGS demonstrate estimated levels of proportional mortality that are much less than the estimates from other coastal power plants in California. This is attributed to the location of the facility along a fairly homogeneous stretch of coastline dominated by sandy habitat that provides less diverse habitat for fishes than rocky coastal or estuarine areas where some of the other facilities are located. In addition, the coastal currents in the vicinity of the HBGS spread any effects of the entrainment losses over tens of kilometers of coastline limiting any effects to the populations. There were no state or federal threatened or endangered species collected during the entrainment sampling…. [T]he project is not within an Area of Special Biological Significance (ASBS). Impacts on marine organisms due to the potential entrainment resulting from the project are relatively small, and would not substantially reduce populations of affected species, or affect the ability of the affected species to sustain their populations. Therefore, impacts would be less than significant.*

Since the Lease Modification Project intake location and source water have not changed, the rationale presented in the 2010 FSEIR for determining impact significance also applies here. For stand-alone operation with 1 millimeter slot wedgewire screens

with a through-screen velocity of 0.5 foot per second or less, intake volume would be about 31 percent less than that analyzed in the 2010 FSEIR. Because entrainment mortality is directly related to the intake volume, the reduction in intake volume proposed for stand-alone operation in the Lease Modification Project would corresponding reduce intake entrainment mortality compared to the 2010 Project. The proposed wedgewire screen would further reduce entrainment, especially for fish.

As shown in Table 4.1-6, estimated impingement for stand-alone operation and entrainment from the Lease Modification Project is less than that of the 2010 Project. Therefore, any impingement or entrainment impacts resulting from the proposed decrease in intake volume and use of screens on the seawater intake pipeline would not substantially reduce populations of any affected species, or affect the ability of any affected species to sustain their populations. This impact would be less than significant.

Table 4.1-6. Impingement/Entrainment Comparison

Project Component		Impingement	Entrainment
2010 Project	Co-located Intake	0 [1]	88,255,368 [2]
	Stand-alone Intake	see 2010 FSEIR Table 4.10-11	103,303,290 [2]
Lease Modification Project Intake	Co-located	0 [3]	88,255,368 (at 127 MGD)
	Stand-alone	0	~74,000,000[4] (at 106 MGD)
Lease Modification Project Discharge	Co-located	N/A	529 million~~121,611,727~~ [5] (at 77 MGD)
	Stand-alone	N/A	543 million~~125,086,348~~ [5] (at 56 MGD)

Notes:

[1] Since this previously-approved operational scenario would draw from HBGS intake water it would not result in any impingement above that attributed to HBGS

[2] Entrained fish larvae do not include fish eggs or other meroplankton propagules or eggs. Estimates based on data collected in 2003-2004. Co-located and stand-alone represent 0.33 percent and 0.02-0.33 percent, respectively, of total population of fish larvae surrounding intake. Source: City of Huntington Beach 2010 (p. 4.10-62 and 4.10-65)

[3] 1 millimeter slot wedgewire screens with a through-screen velocity of 0.5 foot per second or less would minimize impingement

[4] Reduction in entrainment would scale proportionally with the (31%) reduction in intake volume (= (106.7 MGD/127 MGD) x 88255368 larvae); does not include additional reduction in entrainment from installation of 1-mm wedgewire screens, nor to reduction in impact using Empirical Transport Model (ETM) / Area of Production Foregone (APF).

[5] Volumes are for turbulent shearing water volume. Co-located and stand-alone scales with volume, assuming 100~~23~~% of the volume of water required to reduce salinity to 2 ppt above ambient is subject to lethal entrainment = [(762~~175~~ MGD/127 MGD) x 88255368 larvae] and [(782~~180~~ MGD/127 MGD) x 88255368 larvae], respectively. Entrained fish larvae do not include fish eggs or other meroplankton propagules or eggs. Estimates based on data collected in 2003-2004.

Applicant Proposed Measures (APMs)

Poseidon has committed to implement the following APMs that would address impacts from screen maintenance.

APM-1. Offshore Construction Best Management Practices (BMPs) to Protect Water Quality (see Impact OWQ/MB-1)

APM-2. Turbidity Minimization and Monitoring Plan (see Impact OWQ/MB-1)

APM-4. Workers Educational Training (see Impact OWQ/MB-1)

APM-5. Sensitive Marine Species Monitoring and Best Management Practices (BMPs) to Protect Marine Biological Resources (see Impact OWQ/MB-2)

APM-6. Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map (see Impact OWQ/MB-2)

The risk of injury to or mortality of any special-status species from accidental collision with maintenance vessels is considered low as it would be limited due to the short-term maintenance duration and, if it occurred, would not affect the sustainability of any special-status species population, including those associated with MPAs. The above APMs would require a marine wildlife monitor to identify special-status species (marine mammals, sea turtles, etc.) if present. If maintenance activities pose a threat or negative behavioral changes are observed due to construction, the activities would be halted. The APMs would also ensure observers have proper training to protect special-status species and their habitats, and a contact person in the event that protected biological resources are affected. With the implementation of APM-4 and APM-5, impacts from maintenance vessels would be less than significant. Under APM-6, Poseidon would implement measures to avoid kelp, seagrasses, and hard substrate during maintenance. This would help to ensure that only benthic resources living on or within the sediments, such as infauna or macroinvertebrates, could potentially be directly impacted during maintenance. With implementation of the APMs above, impacts to marine biology from maintenance of the screens would be less than significant.

Mitigation Measures

No mitigation measures are required. The reduction in stand-alone operation seawater intake volume and addition of wedgewire screens consistent with the Desalination Amendment would further reduce intake impacts, which the 2010 FSEIR found to be not significant.

Impact OWQ/MB-7: Impact to Special Status Species Populations of Diffuser Operation.

Effects of discharging brine and other desalination process discharges through the new outfall diffuser ~~would be relatively small but~~ may affect special-status species populations **(Less than Significant with Mitigation ~~Significant and Unavoidable~~)**.

Impact Discussion

Diffuser Operation – Salinity and Other Constituent Discharges

Mortality of marine life can result from exposure to toxic salinity levels and from discharge of desalination waste (concentrated brine, filter backwash and subsequent rinse wastewater, and occasional stormwater). Exposure to the brine and other components of the HB Desalination Plant effluent could have adverse effects on bottom-dwelling marine life. Effects could include osmotic stress or shock, the potential formation of hypoxic or anoxic zones, endocrine disruption, compromised immune function, acute or chronic toxicity, and in extreme conditions, death. Some organisms may move away from areas with high salinity or hypoxia (low oxygen), which could change the structure of the local marine life community, but less mobile organisms would not be able to move away and may experience more severe effects (SWRCB 2015a).

The use of a diffuser can ensure a desalination plant's discharges do not exceed the Desalination Amendment's and NPDES permit's receiving water limits for salinity, which requires that brine discharge salinity declines to within 2 parts per thousand (ppt) over natural background salinity (for a target of 35.5 ppt) within 328 feet (100 meters) from the point of discharge (SWRCB 2015b). The 2010 FSEIR found that elevated salinity levels anticipated for the stand-alone operation scenario would be 40 ppt or less at 100 feet from the point of discharge, and would have complied with the Ocean Plan standards in effect at the time. Those standards have now been superseded by the Desalination Amendment. In comparison to the 2010 Project, increased discharge velocity from the multiport diffuser included in the Lease Modification Project would result in a ~~larger~~ smaller brine mixing zone (BMZ)~~, but~~ with lower salinity since discharge through the proposed diffuser would dilute salinity more quickly.

The 2010 FSEIR concluded that areas exposed to high salinity within the BMZ would result in a less-than-significant impact due to the following factors.

- The benthic areas around the discharge structure do not contain natural hard bottom habitats that support sensitive species.
- Fishes, plankton, and other pelagic animals[23] that encounter elevated salinity in the discharge region will have low exposure times (on the order of several hours).
- Foraging areas affected by elevated salinity are limited in size, and would not represent a substantial displacement in foraging areas, or otherwise substantially affect foraging behavior.

[23] Pelagic marine life include fish living in the upper layers of the ocean (not in seafloor sediments).

- No threatened or endangered species or kelp beds exist within the vicinity of the HBGS outfall.
- No significant effects on EFH[24] functions would occur.

The rationale for determining impact significance as presented in the 2010 FSEIR also applies to the proposed Lease Modification Project because the discharge location and sensitive marine resources (or lack thereof) within the BMZ are the same. The 2010 FSEIR determined impacts to special-status species from areas exposed to high salinity within the BMZ would result in a less-than-significant impact. As described above, discharge from the proposed Lease Modification Project would have lower salinity levels. Therefore, greater impacts than analyzed in 2010 FSEIR would not occur. ~~Therefore, elevated salinity and exposure to other process discharges through the diffuser would not substantially reduce populations of affected species, or affect the ability of the affected species to sustain their populations.~~ This impact would be less than significant. However, as described below (Diffuser Operation – Shear Stress) the larvae of special-status species, including those associated with MPAs, may be present near the discharge, and, accordingly, within the brine mixing zone. Mitigation for impacts to special-status species from diffuser-related entrainment (MM OWQ/MB-7) would also compensate for the loss of any special-status species exposed to elevated salinity.

Diffuser Operation – Shear Stress

Discharged brine is diluted by mixing with receiving water. This mixing occurs when the brine is discharged through diffusers. During this process receiving water and its contents including larvae are entrained by the discharge. Shear stress is the measure of friction or force from the discharge on an organism entrained during this process ~~in the path of the discharge~~. At certain velocities, turbulent shear stress can be lethal to marine life~~, thereby resulting in entrainment~~. ~~For purposes of this analysis, t~~The following standards for estimates of diffuser entrainment ~~apply~~ mortality were considered in this analysis.

- Modeling results from Foster et al. (2013) (as cited in SWRCB 2015a) indicate that “the volume of water that is entrained for dilution that is subject to relatively high turbulence intensities and shear stresses is about 23 to 38 percent of the total entrained volume.”

  Dr. Phil Roberts (one of the authors of Foster et al. (2013)), in his comments on the Draft Supplemental EIR (Comment Set P19 in Part II of this Final Supplemental EIR), clarified that the use of 23 percent “is based on the

[24] EFH is defined as the waters and substrate necessary for spawning, breeding, feeding, or growth to maturity for fish species.

hydrodynamics of mixing of diffusers with nozzles inclined at 60 degrees to the horizontal, which is typical for brine diffusers." He notes that the diffusers proposed by Poseidon are at a 47-degree orientation "so the 23% ratio that was devised and predicated for 60° nozzles will not apply" to the proposed diffuser. He explains that the entrainment analysis he prepared for a desalination project in Monterey Bay assumed 100 percent mortality because the project included diffusers that would discharge horizontally and the flows are jet-like over most of their trajectory, so the fraction of entrained water subject to potentially damaging shear stress would be higher than the fraction (23 percent) assumed for diffuser nozzles oriented at 60 degrees. In his comment letter, Dr. Roberts concludes:

> *[T]he issue here is simple and straightforward: Should we assume 23% or 100% or some other fraction of entrained flow as subject to lethal turbulence? For 60 degree nozzles, 23% is a reasonable estimate; for horizontal dense jets dominated by momentum over most of their trajectory, it could approach 100%.*

- The SWRCB (2015a) application of this result to mortality estimates from diffuser entrainment (shear stress) assumes "larvae in 23 percent of the total entrained volume of diffuser dilution water are killed by exposure to lethal turbulence."

The RWQCB, in its comment letter on the Draft Supplemental EIR (Comment Set A9 in Part II of this Final Supplemental EIR), clarified its use of 23 percent in SWRCB 2015a: "The 23 percent estimate is based on a particular case of a single jet discharging dense effluent oriented at an upwards angle of 60°. The 23 percent estimate does not take into account different diffuser designs because the estimate is purely a function of the discharge volume." The RQWCB further clarifies in its comments: "It is important to note that the 23 percent estimate contained in the Staff Report is not a regulatory provision in the Ocean Plan" and that "…the applicable regional water board has discretion to determine whether to use the 23 percent mortality estimate, or some other estimate based on other existing shearing data."

- In ~~the absence of information justifying~~ consideration of this clarification from Dr. Roberts and RWQCB regarding the appropriate use of ~~assumption number other than~~ the 23 percent estimate for the proposed diffuser as well as the statements from experts (Dr. Roberts, RWQCB staff, and Dr. Peter Raimondi of the University of Santa Cruz [see Appendix F1]) that 23 percent may not be the correct percentage to assume for the proposed Lease Modification Project multiport diffuser, and in the absence of a Project-specific entrainment mortality estimate from the proposed diffuser, the CSLC is using ~~this guidance from the SWRCB when presenting estimates of diffuser entrainment~~ a conservative assumption that larvae in 100 percent of the total entrained volume of diffuser dilution water would be killed by exposure to lethal turbulence. This conservative assumption would encompass the mortality that would be estimated by any

project-specific analysis of the proposed diffuser; therefore, CSLC believes using the 100 percent assumption represents a reasonable worst-case scenario for CEQA impact analysis. (A separate rationale for using a 23 percent mortality, provided by the Applicant, is included in Appendix F2).

The CSLC contracted with Dr. Raimondi to peer review Applicant-provided information on operational entrainment impacts.[25] Dr. Raimondi estimated entrainment from the proposed intake and discharge modifications, and provided his expert opinion on population-level impacts of the Lease Modification Project. Appendix F1 presents Dr. Raimondi's peer review results, which inform the following operational entrainment impact analysis.

Because entrainment scales with seawater volume, intake entrainment mortality estimates can provide a relative estimate of mortality from discharge entrainment due to shear stress (see assumptions in footnotes of Table 4.1-6 and information in Appendix F1).

- For co-located operations, an estimated 529 million ~~121,600,000~~ fish larvae per year will likely be entrained with the discharge stream mixed with HBGS cooling water.[26]
- For stand-alone operation, an estimated 543 ~~125~~ million fish larvae will likely be entrained.~~;~~[27] ~~this represents a small fraction of the larvae (approximately 0.11 percent) of the approximately 115,000,000,000 (115 billion) individual larval fish at risk to entrainment that occur within the HB Desalination Plant's source water.~~

A discharge diffuser was not proposed in 2010; therefore, entrainment from shear stress is a new impact of the Lease Modification Project. However, the rationale for determining impact significance as presented in the 2010 FSEIR for the intake applies to the proposed diffuser because the receiving waters (i.e., affected marine populations) are the same. In summary, estimated levels of mortality are relatively low because the proposed modifications are located along a fairly homogeneous stretch of coastline dominated by sandy habitat. The Lease Modification Project is not within an ASBS.

~~Using the assumption that 23 percent of the total volume of dilution water would be exposed to lethal entrainment, impacts on marine organisms from diffuser entrainment~~

[25] The peer review used, but did not verify, these data, which Poseidon submitted as part of its applications to the CSLC and RWQCB for a lease amendment and Water Code section 13142.5, subdivision (b) compliance determination.

[26] See footnote 8 in Table 4.1-6. (~~175~~ 762 MGD of discharge volume from the proposed modifications /127 MGD of intake volume from the 2010 Project) x 88255368 fish larvae entrained from the intake as proposed in 2010). Estimates based on data collected in 2003-2004.

[27] See footnote 9 in Table 4.1-6. (~~180~~ 782 MGD of discharge volume from the proposed modifications /127 MGD of intake volume from the 2010 Project) x 88255368 fish larvae entrained from the intake as proposed in 2010). Estimates based on data collected in 2003-2004.

~~would be relatively small. However, i~~Insufficient information exists to determine whether the larval entrainment of any special-status species would constitute a "substantial adverse effect," and the entrainment would be considered a potentially significant impact under CEQA. A substantial adverse effect is defined, in part, as one that would substantially reduce the number or restrict the range of an endangered, rare or threatened species. As explained by Dr. Raimondi (see Appendix F1), the modeling approach is not designed to detect species that are rare in the sampling area; rather, it is designed for species for which sufficient data exist (i.e., observations of that species) to make robust estimates of proportional mortality. Two features render special-status species (typically) unfit for evaluation: larvae of special-status species are almost by definition rare (e.g., giant sea bass) and are sometimes smaller than mesh size used for sampling (e.g., some stages of black abalone). This means that the absence of such species from either the formal evaluation process (i.e., the ETM/APF~~[28]~~ modeling) or from the list of species sampled in the field studies (as in the Huntington Beach evaluation), should not be taken to indicate that such species would not be entrained. Therefore, this impact analysis assumes that special-status species, including those associated with MPAs, may occur within areas at risk of entrainment. In the absence of information on the larval densities of special-status species at risk of diffuser entrainment, impacts could be potentially significant.

Area of Production Foregone [APF] for Co-located and Stand-Alone Operation

A general description of APF is presented in SWRCB 2015a:

> *Production forgone is the biological productivity lost when marine life is killed by an industrial activity. The APF is the amount of area needed to be created in order to compensate for the lost productivity. APF is calculated by measuring the productivity forgone for a subset of species, then averaging those measurements together. The calculation of APF assumes that production forgone for a subset of species is a representative sample of all species present at that location, even those that are not directly measured. If the habitat calculated using APF is created or restored, the habitat will support the species assessed in the analysis as well as other species in the ecosystem that were not assessed. This means that the average APF for a small subset of species (e.g., 15-20 species) is characteristic of the much larger community, even a community comprised of thousands of different types of organisms.*

Essentially, APF is the area that would need to be added to the system for full compensation of the ecosystem resources provided by that species, including both the species itself and its contribution to the ecological community (Raimondi 2011). In this way, it considers and compensates for all direct and indirect entrainment impacts to all

~~[28] A species-specific APF is the area that would need to be added to the system in order for full compensation of the ecosystem resources provided by that species, including both the species itself and its contribution to the ecological community~~

organisms in the affected source water body. This includes species that were not directly measured in sampling and evaluated in modeling, such as special-status species for the proposed Lease Amendment Project, as described above.

~~The CSLC contracted with Dr. Peter Raimondi of the University of Santa Cruz to peer review Applicant-provided information on operational entrainment impacts.[29] Dr. Raimondi estimated entrainment from the proposed intake and discharge modifications, and provided his expert opinion on population-level impacts of the Lease Modification Project. Appendix F1 presents Dr. Raimondi's peer review results, including his calculation of~~ Dr. Raimondi calculated an APF for the net difference in the amount of larvae entrained during co-located and stand-alone operations between the 2010 Project and the proposed Lease Modification Project; the results are presented below~~, which inform the following operational impact analysis.~~

Co-Located Operation	Seawater Intake	Proposed modifications would result in the same amount of fish larvae entrained per year (88,255,368) as the 2010 Project.
	Discharge	Assuming 100 ~~23~~ percent of the entrained water is subjected to lethal shear, the proposed modifications would result in entrainment of 529 million ~~121,611,727~~ fish larvae per year.
	Total	Total lethal discharge entrainment volume of 762 ~~175~~ MGD equates to an estimated APF of approximately 99 ~~22.81~~ acres.[30]
Stand-Alone Operation	Seawater Intake	Proposed modifications would result in approximately 29,303,290 fewer fish larvae entrained per year (103,303,290 - ~74,000,000) than the 2010 ~~p~~Project. This is a result of the reduction in intake volume from 152 MGD to 106 MGD.
	Discharge	Assuming 100 ~~23~~ percent of the entrained water is subjected to lethal shear, the proposed modifications would result in entrainment of 543 million ~~125,086,348~~ fish larvae per year. This is a result of lethal discharge entrainment volume of 782 ~~180~~ MGD.
	Total	Total of 95,783,058 fish larvae entrained per year (543 million ~~125,086,348~~ - 29,303,290) during operation of the project with proposed modifications. This represents a difference in lethal volume of 736 ~~134~~ MGD (782~~180~~-46 MGD) and equates to an estimated APF of approximately 95.9~~21.5~~ acres.[31]

~~[29] The peer review used, but did not verify, these data, which Poseidon submitted as part of its applications to the CSLC and RWQCB for a lease amendment and section 13142.5, subdivision (b) compliance determination.~~

[30] Estimated using: 23.46 acres x (762~~175~~ MGD/180 MGD), assuming 100 ~~23~~ percent of the entrained water is subjected to lethal shear and based on the relationship between APF values and entrainment volumes that were calculated directly for standalone operations from MBC 2016 (prepared for Poseidon).

[31] Based on equation relating APF to entrained volume of water: (17.003 acres APF/106 MGD = X acres APF/736 ~~134~~ MGD). APF of 17 acres related to 106 MGD (see Tenera 2015, prepared for Poseidon).

The goal of compensatory mitigation calculated using APF is to replace the production forgone that results from operation of the proposed diffuser, thereby ensuring that there is no net productivity loss once mitigation is taken into consideration. The APFs presented above were calculated using a 95 percent confidence interval (consistent with the requirements of the Ocean Plan), which translates to a 95 percent level of certainty that a mitigation that uses these APF will fully compensate impacts (SWRCB 2015a).

Various compensatory mitigation options exist. Generally, they can be defined as "in-kind" mitigation, which creates or restores habitat to replace organisms that would be killed with the same type of organisms, or "out-of-kind" mitigation, which would replace affected organisms with dissimilar ones. For this reason, in-kind mitigation is preferred to out-of-kind mitigation.

Most in-kind mitigation involves creating or restoring habitat that provides ecological features (e.g., foraging or reproductive habitat) that would promote production (e.g., provide a source of new organisms) to replace the production lost (forgone) because of a proposed project. Generally, in-kind mitigation can be "on-site" or "off-site." On-site mitigation is located as close to the project as possible while avoiding re-entrainment of new larvae from the mitigation site by the proposed diffuser.

Mitigation using APF is considered fully compensatory when it is (1) created or restored in a way that is representative of the affected source water body, and (2) when the restored habitat can operate at a similar level of productivity to comparable natural habitat for the life of the project. Sampling, and subsequent ETM/APF calculations, analyzed for the proposed Lease Modification Project on sovereign land offshore Huntington Beach identified and considered species from open water and soft-bottom habitats as well as estuarine species. In-kind mitigation to compensate for impacts of the proposed project would increase production of organisms from these, or more productive, habitat types. Because many soft-bottom species use estuaries during part of their life, mitigation for impacts to soft-bottom habitat with estuarine/wetland habitat is typically considered in-kind mitigation (SWRCB 2015), and is preferred because estuarine/wetland habitat is more productive than soft-bottom habitat.

Diffuser Maintenance

Maintenance of the diffuser would entail manually scraping the external diffuser surfaces with hand tools during quarterly dive inspections and passively sweeping the biofouling debris from the discharge station. Impacts to marine biological resources from diffuser maintenance would be negligible.

Mitigation Measures

The following mitigation measure would require compensatory mitigation, in an acreage determined by APF calculations, for the production foregone due to diffuser entrainment

mortality of marine organisms, including special-status species. As described above, APF is the acreage required to compensate for all direct and indirect entrainment impacts to all organisms in the affected source water body. When implemented according to the standards described in MM OWQ/MB-7, impacts to special-status species from diffuser entrainment, including those associated with MPAs, would be less than significant. In the absence of Santa Ana RWQCB calculations of an APF for all desalination operations pursuant to its authority under Water Code section 13142.5, subdivision (b), an APF for diffuser shear impacts has been calculated assuming larvae in 100 percent of the total volume of dilution water would be exposed to lethal entrainment (see discussion above). If the Santa Ana RWQCB, at the conclusion of its Water Code section 13142.5, subdivision (b) analysis, determines that the APF acreage is less than the acreage provided below, the Commission Executive Officer or her/his designee, in consultation with RWQCB staff, may reduce the number of acres of restoration required.

MM OWQ/MB-7. Develop and Implement A Diffuser-Operation Marine Life Mitigation Plan. At least 6 months prior to installation of the discharge diffuser for the proposed Huntington Beach Desalination Plant, Poseidon shall submit to the California State Lands Commission (CSLC) staff for approval a Diffuser-Operation Marine Life Mitigation Plan (DOMLMP), to be part of the Marine Life Mitigation Plan required under the Desalination Amendment, as compensatory mitigation in an amount that is roughly proportional to the marine life impacts associated with diffuser entrainment. Poseidon shall submit the DOMLMP concurrently to Santa Ana Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), and California Coastal Commission (CCC) staffs to facilitate interagency consultation and Plan development. Poseidon shall subsequently implement the DOMLMP upon approval by the CSLC staff, in consultation with the ~~Santa Ana Regional Water Quality Control Board (~~RWQCB~~)~~, ~~California Department of Fish and Wildlife (~~CDFW~~)~~, and ~~California Coastal Commission (~~CCC~~)~~ staffs. The Plan shall cover at a minimum the following details.

- The DOMLMP shall provide for the restoration of ~~no less than 22.81~~ 99 acres, for co-located operations which is based on the replacement of the area of fish production lost (i.e., Area of Production Foregone [APF]) as a result of adding a diffuser to the discharge pipeline minus any benefits provided by reducing intake flow and adding wedgewire screens approved as part of the 2010 Project. ~~If the APF is determined to be less, the DOMLMP will still provide 22.81 acres of restoration.~~
- If no co-located operations occur (stand-alone operation only), the amount of restoration acreage may be reduced to ~~21.5~~ 95.9 acres ~~but no less~~.
- The DOMLMP shall define the site or project selection process and objectives. It shall define the commitment of long-term funding for restoration and ongoing operation, maintenance, monitoring, and management of an appropriate wetlands site in Orange County for the life of desalination operations. The site or sites selected must provide restored

habitat that can operate at a similar level of productivity to comparable natural habitat for the life of desalination operations. Sites or projects to be considered may include Bolsa Chica Lowlands Restoration Project, Huntington Beach Wetlands, Big Canyon Creek, or other site in Orange County that is approved by the CSLC Executive Officer, in consultation with the RWQCB, CDFW, and CCC staffs.

The Desalination Amendment requires implementation of a Marine Life Mitigation Plan to compensate for all entrainment impacts and marine life impacts, including those within the BMZ. CSLC staff notes that as part of their separate regulatory processes, the RWQCB (e.g., pursuant to Wat. Code, § 13142.5, subd. (b)), CDFW, CCC, or NMFS may impose other measures to compensate for impacts associated with full operation of the HB Desalination Plant or to special-status species. For example, the RWQCB, in coordination with the SWRCB, is the agency designated under the Desalination Amendment to determine the best available site, design, technology and mitigation measures feasible to minimize the intake and mortality of all forms of marine life. MM OWQ/MB-7 requires that the DOMLMP be developed and implemented in consultation with the public agencies with jurisdiction and responsibilities for minimizing and compensating for mortality to marine life. (*Neighbors for Smart Rail v. Exposition Metro Line Constr. Auth.* (2013) 57 Cal.4th 439.)

~~**Residual Impacts**~~

~~Implementation of the above measure would provide a level of compensatory mitigation for impacts to marine biological resources from diffuser-related entrainment; however, because the presence of larvae of special-status species in the impact area is unknown, impacts to special-status species cannot be assessed and are, therefore, conservatively assumed to be significant. Given the poorly understood ecological implications of the proposed diffuser's potential entrainment of special-status species larvae, the impact would remain significant and unavoidable.~~

4.1.5 Cumulative Impacts

The 2010 FSEIR concluded that there would not be a significant cumulative effect on water quality because the development of cumulative projects, in addition to the HB Desalination Plant, would be regularly subject to application of consistent regulatory requirements to avoid and reduce significant effects on water quality. The analysis for this Supplemental EIR has been updated to consider current projects and the location and effects of the Lease Modification Project.

Table 3-1 and Figure 3-1 in Section 3.0, *Cumulative Projects*, present a list of cumulative projects within the Lease Modification Project area. The largest and closest projects to the Lease Modification Project are the HB Energy Project, the Magnolia Oil Storage Tank Farm Demolition, and the Ascon Landfill Remediation Project. These

onshore projects have a low likelihood of affecting ocean water quality, given the permit requirements for stormwater control and their location east of the Pacific Coast Highway. In addition, Figure 3-2 illustrates other desalination projects that are currently operating or proposed in California, illustrating the potential for additional projects to discharge diffused brine to the ocean. The four other Southern California desalination projects (in addition to the HB Desalination Plant) illustrated in Figure 3-2 as "New and Expanded Seawater Desalination Facilities," are spread along about 80 miles of coastline between Carlsbad and Los Angeles. All desalination projects currently being considered for permitting in California would also be subject to the Desalination Amendment, which requires new or expanded seawater desalination plants to use the best available, site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life. With implementation of these regulations, cumulative impingement, entrainment, and discharge effluent effects are anticipated to improve over time. ~~However, t~~The Lease Modification Project would result in potentially significant ~~and unavoidable~~ impacts to ~~water quality due to copper leaching from the wedgewire screens and to~~ special-status marine organisms from diffuser-related entrainment. Implementation of **MM OWQ/MB-7** would require compensatory mitigation, in an acreage determined by APF calculations, for the production foregone due to diffuser entrainment mortality of marine organisms, including special-status species and those associated with MPAs. APF is the acreage required to compensate for all direct and indirect entrainment impacts to all organisms in the affected source water body. Implementation of this mitigation measure would reduce ~~T~~the contribution of the proposed modifications to ~~these impacts would be~~ less than cumulatively considerable.

Construction of the Lease Modification Project would result in temporary significant and unavoidable noise-related impacts to special-status marine mammals during impact pile driving. Other temporary construction-related impacts to marine organisms would be less than significant. Although Lease Modification Project construction may coincide with the construction of local projects and other desalination projects, the nearest projects would not involve offshore construction. Nonetheless, marine mammals potentially affected by pile driving are similarly affected by other underwater disturbances throughout their range. As a result, the Lease Modification Project's impacts from impact pile driving would be a substantial contribution this cumulative impact. The proposed modifications and the cumulative projects would result in a cumulatively considerable impact.

4.1.6 Mitigation Measure/Applicant Proposed Measure Summary

Table 4.1-7 summarizes any mitigation measures or APMs identified in this Supplemental EIR, or those adopted for the 2010 Project if also applicable, to reduce or avoid potential significant impacts associated with the Lease Modification Project.

Table 4.1-7. Impact and MM/APM Summary

Impact	MM/APM
2010 Project	
No significant impacts to ocean water quality and marine biological resources were identified in the 2010 FSEIR and no mitigation measures were required	
Lease Modification Project	
OWQ/MB-1: Impact to Ocean Water Quality of Lease Modification Project Construction Activities	**APM-1**: Offshore Construction BMPs to Protect Water Quality **APM-2**: Turbidity Minimization and Monitoring Plan **APM-3:** Spill Prevention and Response Plan **APM-4**: Workers Educational Training No new mitigation measures recommended
OWQ/MB-2: Impact to Special Status Species Populations of Intake Screen and Diffuser Installation (Not Including Underwater Noise)	**APM-3**: see above **APM-4**: see above **APM-5**. Sensitive Marine Species Monitoring and Best Management Practices (BMPs) to Protect Marine Biological Resources **APM-6**. Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map No new mitigation measures recommended
OWQ/MB-3: Impact to Special Status Species Populations and Movement of Marine Mammal Species as a Result of Underwater Noise during Construction	**APM-5**: see above **MM OWQ/MB-3a**: Vibratory Pile Driving **MM OWQ/MB-3b**: Pile Driving Work Windows **MM OWQ/MB-3c:** Soft Start
OWQ/MB-4: Spread of Invasive and Non-Native Marine Species in the Ocean	**MM OWQ/MB-4**: Prevent Introduction of Invasive Non-Native Species
OWQ/MB-5: Impact to Ocean Water Quality from Wedgewire Screen and Diffuser Operation and Maintenance	**APM-1:** see above **APM-2:** see above **APM-8:** Composition and Maintenance of Wedgewire Screens No new mitigation measures recommended
OWQ/MB-6: Impact to Special Status Species Populations of Intake Flow Reduction (Compared to 2010 Project) and Use and Maintenance of Wedgewire Screens	**APM-1:** see above **APM-2:** see above **APM-4:** see above **APM-5:** see above **APM-6:** see above No new mitigation measures recommended
OWQ/MB-7: Impact to Special Status Species Populations of Diffuser Operation	**MM OWQ/MB-7**: Develop and Implement A Diffuser-Operation Marine Life Mitigation Plan.

4.2 AESTHETICS/LIGHT AND GLARE

In 2010, the City of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), analyzed visual impacts associated with construction and operation of the Huntington Beach Desalination Plant (HB Desalination Plant or 2010 Project) in Sections 4.7 (Aesthetics/Light and Glare) and 4.9 (Construction-Related Impacts) of its certified Final Subsequent Environmental Impact Report (2010 FSEIR). In 2016, Poseidon Resources (Surfside) LLC (Poseidon) submitted an application to the California State Lands Commission (CSLC) to amend Lease PRC 1980.1 to install, operate, and maintain wedgewire screens and a multiport diffuser on the offshore ends of the existing AES Huntington Beach Generating Station (HBGS) seawater intake and discharge pipelines (hereinafter referred to as the Lease Modification Project). This Supplemental EIR analyzes impacts to aesthetics associated with the proposed Lease Modification Project activities for the following reasons.

- The 2010 Project did not include the offshore construction activities that are contemplated in Poseidon's 2016 application.
- The 2010 FSEIR did not address potential impacts to aesthetics associated with construction in the Pacific Ocean offshore the City and Huntington State Beach.

Section 4.2 describes the aesthetic qualities of the Lease Modification Project area, evaluates the type and significance of potential impacts based on anticipated changes to existing conditions, and recommends measures if necessary to avoid or reduce significant impacts. The impact area evaluated includes areas near the seaward end of PRC 1980.1 where subsurface anchoring, dredging, riprap reconfiguration, and pile-driving activities are proposed.

4.2.1 Environmental Setting

4.2.1.1 Existing Setting

Ocean views from the coastal areas of the City represent a valued and popular scenic resource. These areas include a recreational pier, a marina, a wildlife preserve, an 8-mile biking, inline skating, jogging, and walking trail that runs parallel to the Pacific Ocean and along the ocean side of Pacific Coast Highway (PCH; State Route [SR] 1), and "8.5 miles of wide, spacious beaches where in the summer, large crowds gather to watch the special events" (City of Huntington Beach 2017b). Publicly accessible coastal areas onshore of the construction area include: Huntington State Beach (0.3 mile away); Huntington City Beach (0.7 mile distant); Magnolia Marsh along the southeast border of the HBGS, which is one of four areas of wetlands making up the Huntington Beach Wetlands complex; and the Huntington Beach Pier (approximately 1.6 miles northwest of the Lease Modification Project site).

Potential impacts to visual quality are associated with offshore construction equipment and activities. Construction would occur above the submerged ends of the HBGS pipelines near the seaward end of the 11.78-acre lease parcel (PRC 1980.1) at a depth of approximately 33 feet mean lower low water. Figure 4.2-1 (Figure 4.7-4 from the 2010 FSEIR) shows views from the proposed onshore HB Desalination Plant to the offshore area, which appears as a small patch of water indistinguishable from the ocean. Work would be performed from a 180-ton derrick barge anchored above the HBGS discharge and intake pipeline risers (towers) during diffuser and wedgewire screen installation. Two barges would be onsite if the diffuser and screens are installed concurrently (approximately 3 months); separately, the diffuser and screens would be installed in about 2 months and 3 months, respectively. Smaller boats would deliver crew and supplies during construction and be onsite during future maintenance activities.

Short-term construction activities would be distantly visible from onshore beaches and the Huntington By-The-Sea Mobile Home Park adjacent to the HBGS.

4.2.1.2 Sensitivity of Critical Public Views

The visual resources of an area consist of the features of its landforms, vegetation, water surfaces, and cultural modifications (physical changes caused by human activities) that give the landscape its aesthetic qualities. Landscape features, naturally appearing or otherwise, form the overall impression of an area. This impression is referred to as “visual character or quality.” Visual character is studied as a point of reference to assess whether a given project would appear compatible with the established features of the setting, or would contrast noticeably and unfavorably with them. Existing landforms, water surfaces, vegetation, and cultural modifications are treated as an established part of the setting if they reflect how the landscape was formed (i.e., ecological processes versus human activities), how it functions (i.e., as part of an urban versus agricultural context), and how it is structured (e.g., “patterns” of development, such as irrigated croplands versus the natural mosaic of grasslands and woodlands).

Visual resources also have a social setting, which includes a viewer’s expectations, activities, awareness, values, and goals regarding visual quality. This social setting is addressed as “visual sensitivity,” the relative degree of public interest in visual resources and concern over adverse changes in the quality of that resource (Bureau of Land Management 1986). Public sensitivity is not always related to obvious aesthetic appeal. For example, the Federal Highway Administration has determined visual quality to be the favorable or unfavorable response that viewers have to their environment (U.S. Department of Transportation [DOT] 2015). As applied to visual impact analyses, “sensitivity” refers to public attitudes about specific views, or interrelated views, and is a key factor in assessing how important and significant a visual impact may be.

Figure 4.2-1. Desalination Facility Visual Simulation (2010 FSEIR Figure 4.7-4)

Source: 2010 FSEIR

In the following analysis, the environmental setting for aesthetics is determined by the Lease Modification Project's Area of Visual Effect (AVE), or the area in which the project would be visible. Two components of the AVE are: (1) the sensitivity of critical public views that would be most affected by project actions (e.g., views with the greatest intensity of potential impact due to viewer proximity to the project, project visibility, and duration of the affected view); and (2) the Visual Modification Class (VMC), which is a measure of the existing visual conditions of the AVE and the extent to which alterations within the AVE would be noticeable to the public. The importance of the affected landscape is inferred from the following indicators of sensitivity. The current visual quality of the physical environment is described as its existing visual condition, which is defined in terms of the four VMCs noted in Table 4.2-1.

Table 4.2-1. Visual Modification Class (VMC) Definitions

VMC	Definition
1	**Not Noticeable.** Changes in the landscape are within the field of view but generally would be overlooked by all but the most concerned and interested viewers; they generally would not be noticed unless pointed out (inconspicuous because of such factors as distance, screening, low contrast with context, or other features in view, including the adverse impacts of past activities).
2	**Noticeable, Visually Subordinate**. Changes in the landscape would not be over-looked (noticeable to most without being pointed out); they may attract some attention but do not compete for it with other features in the field of view, including the adverse impacts of past activities. Such changes often are perceived as being in the background.
3	**Distracting, Visually Co-Dominant**. Changes in the landscape compete for attention with other features in view, including the adverse impacts of past activities (attention is drawn to the change about as frequently as to other features in the landscape).
4	**Visually Dominant, Demands Attention**. Changes in the landscape are the focus of attention and tend to become the subject of the view; such changes often cause a lasting impression on the affected landscape.

High Sensitivity. High sensitivity suggests that at least some part of the public is likely to react strongly to a threat to visual quality. Concern is expected to be great because the affected views are rare, unique, or in other ways are special to the region or locale. A highly-concerned public is assumed to be more aware of any given level of adverse change and less tolerant than a public that has little concern. A small modification of the existing landscape may be visually distracting to a highly sensitive public and represents a substantial reduction in visual quality.

Moderate Sensitivity. Moderate sensitivity suggests that the public would probably voice some concern over substantial visual impacts. Often the affected views are secondary in importance or are similar to others commonly available to the public. Noticeably adverse changes would probably be tolerated if the essential character of the views remains dominant.

Low Sensitivity. Low sensitivity is considered to prevail where the public is expected to have little or no concern about changes in the landscape. This may be because the affected views are not "public" (not accessible to the public) or because there are no indications that the affected views are valued by the public. For instance, little public concern for aesthetics is assumed to pertain to views from industrial, commercial, and purely agricultural areas, although agricultural areas in general are prized for their open space value, and views of such are highly sensitive. Visual sensitivity is low for views from all sites, areas, travel routes, and sections of travel routes not identified as moderate or high in sensitivity.

4.2.1.3 Determining the Area of Visual Effect

In order to determine the visual quality of the Lease Modification Project area, a range of public views has been identified that may be affected during construction. Viewpoints (areas from which construction would be visible) presented in Table 4.2-2 represent areas that are accessible to the public and/or are recognized for their aesthetic values.

Table 4.2-2. Critical Public Views Near Lease Modification Project

Site	Sensitivity Level	VMC Class
Huntington State Beach. This recreational area within the City of Huntington Beach is recognized for its sweeping ocean views and its free public amenities. The State Beach adjacent to the HBGS is the nearest onshore location (0.3 mile) to the offshore lease area where installation of the screens and diffuser would occur. Views from the State Beach seaward belong to the high sensitivity classification because of the site's specific nature as a designated area for aesthetic and recreational purposes with scenic vistas to the seaward; and because a threat to visual quality would likely be met with a strong reaction from the public. Several elements visible from Huntington State Beach must be looked at cumulatively when analyzing visual quality, and these existing elements are "Noticeable, Visually Subordinate" within the Lease Modification Project area's environmental setting. Built features visible from the State Beach include industrial areas such as the HBGS, residences at the Huntington By-The-Sea Mobile Home Park, and built recreational features within the State Beach that are congruous with the State Beach's public use (e.g., lifeguard towers).	**High**	**2**
Magnolia Marsh. The Huntington Beach Wetlands Conservancy (Conservancy) manages the Magnolia Marsh along the southeast border of the HBGS. Conservancy facilities also include an interpretive and education center and a regional wildlife care facility. Magnolia Marsh is designated as the Conservancy's primary area for interpretive trail use and ecotourism. Visitors to the marsh use the observation deck at the northwest corner of the marsh; this observation deck also has views of the ocean to the west including the Lease Modification Project area. Views from Conservancy facilities seaward belong to the moderate sensitivity classification due to this site's location adjacent to industrial facilities (the	**Moderate**	**2**

Table 4.2-2. Critical Public Views Near Lease Modification Project

Site	Sensitivity Level	VMC Class
operating HBGS) and views of the Pacific Coast Highway (PCH) between the observation deck and ocean. Additionally, the predominant focus of viewers is of the marsh to the east and southeast, not directly toward the ocean. Several elements visible from Conservancy facilities must be looked at cumulatively when analyzing visual quality, and these existing elements are "Noticeable, Visually Subordinate" within the Lease Modification Project area's environmental setting (VMC-2). Built features visible from Conservancy facilities include industrial areas such as the HBGS, traffic along PCH, and the highway infrastructure itself.		
Huntington City Beach and Huntington Beach Municipal Pier. Huntington City Beach is a 3.5-mile stretch of public beach adjacent to downtown Huntington Beach. Near the center of the length of this beach is the Huntington Beach Pier; this area near the pier is where beachgoer density is highest on any given day. The beach and pier are used by sport fishermen, pedestrians and sightseers, surfers and other recreationists. Tourist-oriented uses include a restaurant and shops. The U.S. Open of Surfing is an annual event held the last week of July and often into the first week of August than can attract up to 500,000 visitors. Views from Huntington City Beach and Huntington Beach Municipal Pier seaward belong to the high sensitivity classification because of the site's specific nature as a designated area for aesthetic and recreational purposes with scenic vistas to the seaward. The Huntington Beach Municipal Pier is an icon of the city and a popular tourist destination; any threat to visual quality would most likely be met with a strong reaction from the public. Several elements visible from Huntington State Beach must be looked at cumulatively when analyzing visual quality, and these existing elements are "Distracting, Visually Co-Dominant" within the Lease Modification Project area's environmental setting (VMC-3). Views of the ocean are mostly unobstructed by development with the exception of boats and oil platforms, which are regularly visible in the area.	**High**	**3**

4.2.2 Regulatory Setting

Appendix A summarizes relevant federal and state regulations related to aesthetics and visual quality. The local regulatory setting related to aesthetics/light and glare and protecting coastal views, which was not included in the 2010 FSEIR, is summarized below for reference although the Lease Modification Project would occur offshore within the CSLC's jurisdiction.

General Plan goals, objectives, and policies pertaining to visual and aesthetic resources in general, development in areas designated as Public, and development in the Coastal Zone are included in the Coastal Element of the General Plan (City of Huntington Beach 2001) to guide development for its portion of the Coastal Zone. The Coastal Element includes the following provisions related to aesthetics, light, and glare:

- C 4.1.1. The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect public views to and along the ocean and scenic coastal areas.
- C 4.1.4. Preserve skyward, night time views through minimization of lighting levels along the shoreline.

The General Plan Land Use Element, Urban Design Element, Circulation Element, Utilities Element, and Environmental Resources/Conservation Element also contain goals, objectives, and policies that address aesthetics. Titles 21, 22, 23, and 24 of the City's Zoning and Subdivision Ordinance contain development and design standards that are applicable to preserving and enhancing public visual resources onshore within the City's Local Coastal Program (LCP) jurisdiction.

4.2.3 Significance Criteria

The criteria for determining the significance of impacts for this analysis are the same that were used in the 2010 FSEIR to evaluate impacts to Aesthetics/Light and Glare, and are based on the State CEQA Guidelines Appendix G Checklist, specifically if the Lease Modification Project would:

a) have a substantial adverse effect on a scenic vista

b) substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway

c) substantially degrade the existing visual character or quality of the site and its surroundings

d) create a new source of substantial light or glare that would adversely affect day or nighttime views in the area

4.2.4 Environmental Impact Analysis and Mitigation

2010 PROJECT

In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB Desalination Plant co-located and stand-alone operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted the following Findings for aesthetics and light and glare (Item 62, October 29, 2010).

- The [2010 Project] is not anticipated to create significant impacts to aesthetics or visual character. Regardless, mitigation measure ALG-1 has been incorporated into the SEIR to further reduce this already less than significant impact. Less than significant impact with mitigation.

- The [2010 Project] is not anticipated to create significant impacts related to light and glare. Regardless, mitigation measure ALG-2 has been incorporated into the SEIR to further reduce this already less than significant impact. Less than significant impact with mitigation.

The City and CSLC also adopted a Mitigation Monitoring Program (MMP) as part of their respective discretionary actions. Four mitigation measures (MMs) in the MMP addressed aesthetic impacts, including two MMs for construction (CON) activities:

- **2010 MM CON-17** (Security Fencing and Construction Site Maintenance)
- **2010 MM CON-18** (Distance of Construction Activities and Equipment from Adjacent Residential Areas)
- **2010 MM ALG-1** (Design Details to Minimize Visual Impacts)
- **2010 MM ALG-2** (Lighting Plan)

SWRCB FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT (SED)

In its *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes*, the SWRCB (2015a) identified potentially significant impacts to aesthetics related to the installation of intake and outfall structures in offshore waters (onshore activities are not discussed here), including the following impacts and guidance on mitigation measures if such impacts are found to be significant.

Impact	Mitigation Measures
Construction activities related to the installation of intake and outfall structures: • May have a substantial adverse effect on a scenic vista • May substantially degrade the existing visual character or quality of the site and its surroundings.	Limit construction to spring, fall, and winter weekdays to avoid disrupting recreational, pleasure boating or site-seeing activities associated with the summer tourist season

ENVIRONMENTAL IMPACT ANALYSIS – LEASE MODIFICATION PROJECT

Proposed Lease Modification Project elements consist of offshore construction activities required to install wedgewire screens and a multiport diffuser on the HBGS pipelines, reduction in seawater intake volume (to 127 MGD for co-located and 106.7 MGD for stand-alone) through the new screens, and operation and maintenance of the screens and diffuser. Table 4.2-3 at the end of this section summarizes potential impacts and proposed mitigation measures.

Impact ALG-1: Visual Impacts from Offshore Construction Activities.

Use of a 180-ton derrick barge and support tugboats and other vessels would create temporarily visually negative impacts **(Less than Significant).**

Impact Discussion

The City's beaches, coastal wetlands, and pier draw visitors year-round. The City is also known for hosting large crowds to watch special events such as the US Open of Surfing, billed as "the world's largest surf competition and lifestyle festival [where] over half a million people cruise the sand on the south side of the Huntington Beach Pier for nine free fun-filled days" (Surf City USA 2017). The proposed construction activity, however, is not likely to significantly affect the existing visual character or quality of the site and its surroundings given its relatively small footprint, distance from shore, and the presence of other vessels and oil platforms on the horizon.

The visual impact of the Lease Modification Project during the construction phase would be related to the presence of the 180-ton derrick (crane) barge, tugboats, and supply and crew boats offshore Huntington State Beach. The construction zone is very small relative to the expanse of ocean views from onshore, and construction activities would be short-term: 2 to 5 months total depending on whether construction periods overlap or occur at different times. Diffuser and wedgewire screen installation would be performed from the barge anchored above the HBGS discharge and intake pipeline risers (towers). Two barges would be onsite if the diffuser and screens are installed concurrently (approximately 3 months); separately, the diffuser and screens would be installed in about 2 months and 3 months, respectively. Smaller boats would deliver crew and supplies during construction and be onsite during future maintenance activities.

Underwater construction on the multiport diffuser, wedgewire screens and existing riprap surrounding the pipeline risers (towers) would not be visible from shore. Figure 4.2-1 (Figure 4.7-4 from the 2010 FSEIR) shows views from the proposed onshore HB Desalination Plant to the offshore construction area, which appears as a small patch of water indistinguishable from the ocean. Short-term construction activities would be distantly visible from onshore beaches and the Huntington By-The-Sea Mobile Home Park adjacent to the HBGS. SR 1, the nearest highway to the offshore work site, is not a designated scenic highway in this area (California Division of Tourism 2017). Boats and oil platforms are regularly visible in the area, and the temporary presence of a construction barge and vessels in offshore waters would normally not compromise scenic vistas from shore. Marine vessels traveling to and from the Port of Long Beach for Lease Modification Project-related activities would overlap with other normal ongoing marine traffic in to and out of the Port.

Offshore construction using marine vessels would not generate significant visual impacts to Huntington State Beach, Magnolia Marsh, or Huntington City Beach/

Huntington Municipal Pier (see Table 4.2-2) or to residents of the Huntington-By-The-Sea Mobile Home Park. Lease Modification Project operations would have no long-term visual impact since the screens and diffuser would be submerged. Maintenance of the screens would require inspection dives conducted at 2-week intervals during the first few months and ~~quarterly~~ every other month thereafter; maintenance activities would be completed within at most 10 hours for each trip, depending on the type of wedgewire screen installed, and would involve one service boat each time maintenance is performed. Air-burst cleaning vessels may be used if the screens ~~are~~ do not fully self-clean~~ing or cannot be cleaned by divers~~. Similar to construction, the temporary presence of service boats for maintenance activities would not substantially compromise scenic vistas because boats are regular features of the visual environment in this area. Therefore, impacts would be less than significant.

Mitigation Measures

No significant impacts are identified for this impact; no mitigation measures are required.

Impact ALG-2: Creation of New Sources of Substantial Light or Glare such as Nighttime Illumination.

Nighttime illumination could cause temporary adverse visual impacts **(Less than Significant with Mitigation).**

Impact Discussion

Lease Modification Project construction would occur only during daylight hours. Although boats are features of the existing visual environment, nautical safety and security lights are required on the barge(s) that are moored overnight ~~at the offshore construction site f~~For the duration of construction, the barge(s) moored overnight at the offshore construction site will have nighttime nautical and security lights as required. Lease PRC 1980.1 already includes a lease condition related to onshore lighting, and a similar measure for offshore lights is feasible. Because the wedgewire screens and diffuser would be submerged, there would be no permanent light sources or potential to create any new source of glare. Maintenance of the offshore structures would also be performed during daylight hours. Therefore, impacts associated with light or glare would be less than significant with mitigation.

Mitigation Measures

Of the four adopted mitigation measures (two construction and two operations) related to aesthetic impacts, three apply only to onshore activities. The fourth measure (2010 MM ALG-2) could be adapted to apply to offshore installation of the wedgewire screens and diffuser.

2010 MM ALG-2. The Applicant shall submit a lighting plan to be reviewed and approved by the City. The plan shall:

- Specify that light intensity for outdoor lighting shall be limited to that necessary for adequate security and safety
- Demonstrate that outside lighting shall be directed to prevent spillage onto adjacent properties

Implementation of **MM ALG-2a** would complement 2010 MM ALG-2 by addressing construction barge lighting.

MM ALG-2a: Lighting Plan (Offshore Waters). The Applicant shall add an addendum to the Huntington Beach Desalination Plant lighting plan to specify that outdoor light intensity on construction barges anchored or moored overnight at the offshore Lease Modification Project site shall be limited to nautical lights necessary for vessel safety and that barge security lighting shall be shielded where feasible or directed downwards.

4.2.5 Cumulative Impacts

The 2010 FSEIR concluded that the HB Desalination Plant would not generate cumulatively significant aesthetic impacts within the surrounding area because the site design features and park improvements included in the development of the 2010 Project and/or cumulative projects would prevent or offset any potential impacts to scenic resources. The analysis for this Supplemental EIR has been updated to consider current projects and the location of the Lease Modification Project.

Due to ~~its~~ the offshore location of the Lease Modification Project, submerged nature of the physical improvements, small construction zone, short-term construction period, and infrequently required maintenance activities, impacts to visual resources would be less than significant as discussed above. Barges moored offshore for the short duration of construction, including nautical safety lighting on those barges, could minimally change the aesthetic character of the area and introduce a new source of lighting that would be addressed by implementation of **MM ALG-2a**. Nighttime vessel lighting is the only activity in the cumulative impact study area (see Table 3-1, *Relevant Cumulative Projects in HB Desalination Plant Area*, in Section 3, *Cumulative Projects*) with impacts similar to the Lease Modification Project, in part because onshore projects would conform to local and regional standards for aesthetics, light, and glare. Therefore, the Lease Modification Project would not contribute to a cumulatively considerable adverse impact with respect to aesthetics, light, and glare when considered with other everyday sources of light and visual components in the area and when the short-term, temporary nature of the construction and operational activities is considered. No mitigation is required.

4.2.6 Mitigation Measure/Applicant Proposed Measure Summary

Table 4.2-3 summarizes any mitigation measures or Applicant Proposed Measures (APMs) identified in this Supplemental EIR, or those adopted for the 2010 Project if also applicable, to reduce or avoid potential significant impacts to aesthetics.

Table 4.2-3. Impact and MM/APM Summary

Impact	MM/APM
2010 Project	
No significant impacts to aesthetics were identified. Mitigation measures required in the 2010 FSEIR addressed onshore construction and operation activities. • **2010 MM CON-17** (Security Fencing and Construction Site Maintenance) • **2010 MM CON-18** (Distance of Construction Activities and Equipment from Adjacent Residential Areas) • **2010 MM ALG-1** (Design Details to Minimize Visual Impacts) • **2010 MM ALG-2** (Lighting Plan)	
Lease Modification Project	
ALG-1: Visual Impacts from Offshore Construction Activities	None recommended ~~No new mitigation measures recommended~~
ALG-2: Creation of New Sources of Substantial Light or Glare such as Nighttime Illumination	**MM ALG-2a:** Lighting Plan (Offshore Waters)

4.3 AIR QUALITY

In 2010, the City of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), analyzed impacts to air quality associated with construction and operation of the Huntington Beach Desalination Plant (HB Desalination Plant or 2010 Project) in Sections 4.4 (Air Quality) and 4.9 (Construction-Related Impacts) of its certified Final Subsequent Environmental Impact Report (2010 FSEIR). In 2016, Poseidon Resources (Surfside) LLC (Poseidon) submitted an application to the California State Lands Commission (CSLC) to amend Lease PRC 1980.1 to install, operate, and maintain wedgewire screens and a multiport diffuser on the offshore ends of the existing AES Huntington Beach Generating Station (HBGS) seawater intake and discharge pipelines (hereinafter referred to as the Lease Modification Project). This Supplemental EIR analyzes impacts to air quality associated with the proposed Lease Modification Project activities for the following reasons.

- The 2010 Project did not include the offshore construction activities that are contemplated in Poseidon's 2016 application.
- The 2010 FSEIR did not address additional offshore air emissions associated with construction activities in the Pacific Ocean.

Section 4.3 describes air quality in the Lease Modification Project area, evaluates the type and significance of potential impacts based on anticipated changes to existing conditions, and recommends measures if necessary to avoid or reduce significant impacts. Impacts associated with greenhouse gas (GHG) emissions are addressed in Section 4.6, *Greenhouse Gas Emissions*. The impact area evaluated includes areas near the seaward end of PRC 1980.1 where anchoring, dredging, riprap reconfiguration, and pile-driving activities are proposed and along construction vessel routes.

4.3.1 Environmental Setting

Lease Modification Project activities would occur within the South Coast Air Basin (SCAB), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAB includes the urbanized areas of Los Angeles, Riverside, San Bernardino, and Orange counties and the ocean offshore of the South Coast. The nearest residential area is the Huntington By-The-Sea Recreational Vehicle (RV) Park, located approximately 0.55 mile inland from the offshore construction site. The description of the air quality and air resources at and around the proposed 13-acre desalination facility has not changed since the 2010 FSEIR, although attainment designations for certain pollutants have changed, as shown in Table 4.3-1.

Table 4.3-1. South Coast Air Basin Attainment Designations (2016)

Pollutant	Federal Designation	State Designation
Ozone (8-hour)	Nonattainment (Extreme)	Nonattainment
PM_{10}	Attainment (Maintenance)	Nonattainment
$PM_{2.5}$	Nonattainment (Serious)	Nonattainment
CO	Attainment (Maintenance)	Attainment
NO_2	Unclassifiable/Attainment	Attainment
SO_2	Unclassifiable/Attainment	Attainment

Source: SCAQMD 2016b.
Acronyms: CO = carbon monoxide, NO_2 = nitrogen dioxide, PM = particulate matter, $PM_{2.5}$ = PM less than 2.5 microns in diameter, PM_{10} = PM less than 10 microns in diameter, SO_2 = sulfur dioxide.

4.3.2 Regulatory Setting

Appendix A summarizes relevant federal and state regulations related to air quality. One regional air quality management plan has changed since the 2010 FSEIR was certified: the SCAQMD Vision for Clean Air: A Framework for Air Quality and Climate Planning. In 2012 and in 2016, the SCAQMD released and updated the regional planning framework that combines air pollution control strategies with climate goals; future emissions controls assumed that the future transportation fleet would become more reliant on electric power (SCAQMD ~~2012~~2016a). The SCAQMD ~~is developing an~~ adopted the update to the Air Quality Management Plan ~~for approval~~ in March 2017. While reducing NOx emissions remains a primary focus of the plan, ~~D~~desalination facilities, the region's water supply, and energy used for water supplies are not specifically mentioned in the current plan (SCAQMD ~~2012~~2016a).

4.3.3 Significance Criteria

The criteria for determining the significance of impacts for this analysis are the same that were used in the 2010 FSEIR to evaluate air quality impacts, and are based on the State CEQA Guidelines Appendix G Checklist, specifically if the Lease Modification Project would:

- Conflict with or obstruct implementation of the applicable air quality plan
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation
- Result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is nonattainment under applicable National Ambient Air Quality Standards (NAAQS) or California Ambient Air Quality Standards (CAAQS) (including releasing emissions that exceed quantitative thresholds for ozone precursors)
- Expose sensitive receptors to substantial pollutant concentrations
- Create objectionable odors affected a substantial number of people

4.3.3.1 Thresholds of Significance

Project-related emissions are quantified in this analysis and compared against significance thresholds established by the local air quality management district as recommended for use in the CEQA process. The SCAQMD Air Quality Analysis Handbook includes guidelines for assessing potential impacts to regional criteria air pollutants, localized air pollutant concentrations, toxic air contaminant levels, and odors. These thresholds are designed to identify when a project could create a violation of an ambient air quality standard or contribute substantially to an existing air quality violation.

According to SCAQMD (2015) recommendations, an impact to regional air quality is considered significant if the mass of emissions exceeds the standards in Table 4.3-2. For comparison, Table 4.3-2 also provides criteria air pollutant emissions during construction of the offshore intake and diffuser system, and Lease Modification Project operations and maintenance (discussed below).

Table 4.3.2. SCAQMD Thresholds and Estimated Emissions

SCAQMD Thresholds						
	NO_x	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**SO_x**
Regional daily construction-phase activity thresholds	100	75	150	55	550	150
Regional daily operation-related activity thresholds	55	55	150	55	550	150
Localized Significance Threshold (at 500 m)	219	–	135	76	–	–
Lease Modification Project Daily Maximum Construction-Phase Emissions						
Screen and Diffuser Construction	73.85	6.71	4.26	2.13	34.52	0.15
Lease Modification Project Daily Maximum Operation and Maintenance Emissions						
Screen and Diffuser O & M	6.38	1.16	0.29	0.22	5.19	0.01

Source: SCAQMD (2015); Dudek (2017)
Notes: All measurements in pounds per day (lb/day)
Acronyms: "—" = no applicable threshold, m = meter, CO= carbon monoxide, NO_x = nitrogen oxides, PM = particulate matter, $PM_{2.5}$ = PM less than 2.5 microns in diameter, PM_{10} = PM less than 10 microns in diameter, SO_x = sulfur oxides, VOC = volatile organic compound.

The SCAQMD (2008) localized significance thresholds are for CEQA agencies to use in determining whether mass emissions rates would likely cause a localized impact to ambient air quality. These localized thresholds (1) represent the maximum emissions that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standards, and (2) vary depending on the air district–defined source-receptor area (SRA), which is SRA 18 for Huntington Beach (SCAQMD 2009b). For areas within 500 meters of any 1-acre construction spread, the localized air pollutant concentrations resulting from the construction emissions could cause a significant impact if the daily mass of emissions exceeds the standards above.

4.3.3.2 Analysis Methodology

Short-term construction-related emissions of criteria air pollutants, including ozone precursors, are quantified based on the anticipated construction schedule, activity duration, and equipment types to be used (Dudek 2017). Limited activities at the Port of Long Beach (POLB) would include equipment to load the construction barge (forklift, wheel loader, and crane), construction worker vehicles, and potentially off-site haul trucks. Offshore activities involve three different types of vessels: a work boat or utility boat, crew boat, and a tug boat used at the beginning and end of construction to position a barge. Onsite construction emissions also include a crane on the barge.

The emissions-estimating software California Emissions Estimator Model (CalEEMod) Version ~~2012.3.2.2~~ 2016.3.1 is used for onshore sources, and emissions estimates are developed for commercial harbor craft sources, assuming the different levels of daily activities for each of the construction phases (Dudek 2017). Emissions due to longer-term operation and maintenance trips are quantified separately. The resulting maximum rates of daily emissions are compared with the significance criteria.

4.3.4 Environmental Impact Analysis and Mitigation

2010 PROJECT

The 2010 FSEIR concluded that (1) impacts from all criteria air pollutant emissions during operations, and some criteria air pollutant emissions during construction, would be less than significant, and (2) even with incorporation of mitigation measures, there would be a significant and unavoidable impact from other emissions during construction of the HB Desalination Plant and pipelines. In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB Desalination Plant co-located and stand-alone operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted the following Findings for air quality (Item 62, October 29, 2010).

- The [2010 Project] will not result in significant impacts in regards to mobile source emissions or create a [Carbon Monoxide (CO)] Hotspot. Less than significant impact.
- The [2010 Project] would not result in significant air quality impacts in regards to electricity consumption as part of the proposed project under the co-locating scenario or the stand-alone operating condition. Less than significant impact.
- The [2010 Project] will not conflict with local and regional air quality planning documents. Less than significant impact.
- The [2010 Project] may have adverse short-term construction related impacts, both individually and cumulatively, in regards to air quality. Changes or alterations have been required in, or incorporated into, the project that avoid or

substantially lessen the potential significant environmental effects identified in the [2010 FSEIR], including standard conditions, project design features and incorporation of mitigation measures CON-10 through CON-14. In addition, the South Coast Air Quality Management District and California Air Resources Board have jurisdiction over stationary and mobile emission sources, respectively. Even after incorporation of mitigation measures CON-10 to CON-14, the project will result in unavoidable significant impacts, both individually and cumulatively, in regards to short-term construction related reactive gases including NOx, PM10, and PM2.5. Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible additional mitigation measures or alternatives identified in the SEIR.

- Cumulative Short-Term Air Quality Impacts. As discussed under Section 5.3 regarding cumulative projects, because construction air quality impacts can tend to have a noticeable localized effect in addition to their contribution to the overall regional air basin, projects in close proximity to the proposed [2010 Project] site were evaluated for short-term, construction-related impacts. The pollutants generated from construction of these projects could result in an impact on ambient air quality that would overlap with those of the proposed project if the construction work occurs in close proximity and at the same time. Potentially significant and unmitigable short-term, construction-related impacts were identified that would contribute to potentially significant cumulative impacts. Therefore, short-term, construction-related air quality impacts, including the project's contribution to those impacts, are considered significant.

The City and CSLC also adopted a Mitigation Monitoring Program (MMP) as part of their respective discretionary actions. Five mitigation measures (MMs) in the MMP addressed air quality impacts, all five of which were for construction (CON) activities:

- **2010 MM CON-10** (Dust Suppression)
- **2010 MM CON-11** (Hauling Activities)
- **2010 MM CON-12** (Construction Equipment Maintenance)
- **2010 MM CON-13** (Architectural Coating ROG Emission Reduction)
- **2010 MM CON-14** (Diesel Fuel Reduction Plan)

SWRCB FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT (SED)

In its *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes*, the SWRCB (2015a) identified potentially significant impacts to air quality related to the installation of intake and outfall structures in offshore waters, including the following impacts and guidance on mitigation measures if such impacts are found to be significant.

Impact	Mitigation Measures
Construction activities related to the installation of intake and outfall structures may have the potential to: • conflict with or obstruct implementation of an applicable air quality plan • violate air quality standards or contribute substantially to an existing or project air quality violation • result in considerable net increase of any nonattainment pollutant for which the Lease Modification Project region is under an applicable federal or state ambient air quality standard	To minimize emissions from internal combustion engines • Where feasible, use equipment powered by sources that have lowest emissions, or powered by electricity • Utilize equipment with smallest engine size capable of completing project goals to reduce overall emissions • Minimize idling time and unnecessary operation of internal combustion engine powered equipment For diesel powered equipment: • Utilize diesel powered equipment meeting Tier 2 or higher emissions standards to the maximum extent feasible. • Utilize portable construction equipment registered with the State's portable equipment registration program • Utilize low sulfur diesel fuel and minimize idle time • Ensure all heavy duty diesel powered vehicles comply with state and federal standards applicable at time of purchase • Utilize diesel oxidation catalyst and catalyzed diesel particulate filters or other approved emission reduction retrofit devices installed on applicable construction equipment used during individual projects

ENVIRONMENTAL IMPACT ANALYSIS – LEASE MODIFICATION PROJECT

Proposed Lease Modification Project elements consist of offshore construction activities required to install wedgewire screens and a multiport diffuser on the HBGS pipelines, reduction in seawater intake volume (up to 127 MGD for co-located and 106.7 MGD for stand-alone) through the new screens, and operation and maintenance of the screens and diffuser. Air quality impacts relevant to Lease Modification Project operational scenarios (co-located operations and stand-alone) are similar and are not addressed separately in this analysis. Table 4.3-3 at the end of this section summarizes potential impacts and proposed mitigation measures.

Impact AQ-1: Air Emissions from Construction

Construction would increase emissions in onshore and offshore areas **(Significant and Unavoidable).**

Impact Discussion

Lease Modification Project construction activities would occur in state waters offshore of the HBGS and along offshore vessel routes between the POLB and the site. These open waters are within the jurisdiction of the SCAQMD. Construction would result in a

temporary addition of pollutants to the SCAB caused primarily by marine vessels, barge-based construction equipment and personal vehicles. Construction emissions would vary substantially from day to day, depending on the level of activity and the phase of work, which would include demolition, dredging, riprap reconfiguration, and physically installing the screen intake and diffuser systems.

The nearest residential area, the Huntington By-The-Sea RV Park, is approximately 0.55 mile (2,900 feet) from the nearest proposed offshore work area. The SCAQMD recommends evaluating localized construction-phase impacts using localized significance thresholds (LSTs), which depend on the distance from the construction spread to sensitive receptors. Because the Lease Modification Project outfall and intake towers where installation of the diffuser and wedgewire screens would occur are either 1,500 or 1,650 feet offshore, and the nearest residences are substantially further away, this analysis conservatively compares the emissions from the proposed construction activities against the less than significant criteria that apply to receptors at a distance of at least 1,641 feet.

Construction-phase emissions estimates are based on the following assumptions, which are based on a worst-case overlap of construction activities (Dudek 2017):

- Intake and discharge modifications would require use of equipment, vehicles, and marine vessels for approximately 6 weeks over a 2- to 5-month period; these proposed modifications may occur at the same time the HB Desalination Plant is constructed.
- Approximately 13 to 23 workers would be present during each construction phase.
- Marine vessels would include three types of sources: a tug boat used generally on the first and last days, a work boat or utility boat used occasionally or on certain days, and a crew boat used during all days.
- Boats would travel about 16.5 nautical miles (nm) one way, based on a route from the POLB to 0.5 mile offshore of the HB Desalination Plant.
- Marine vessel engines would be model year 2009 or newer, and thus compliant with Tier 3 marine compression-ignition standards.
- Marine vessel engines would use fuel with 0.0015 percent (15 parts per million [ppm]) sulfur diesel fuel (i.e., ultra-low sulfur fuel) and meet other California Air Resources Board (CARB) Harbor Craft regulations to reduce emissions from commercial harbor craft (which in California include crew and supply boats, charter fishing vessels, commercial fishing vessels, ferry/excursion vessels, pilot vessels, towboats or push boats, tug boats, and work boats; see https://www.arb.ca.gov/ports/marinevess/harborcraft.htm).

- Onshore emissions would be limited to crew personal vehicles and some deliveries during days when dredging and dredged material handling would not occur. The peak days of onshore emissions would be during dredging when equipment would be needed for material transfer at the POLB, and haul trucks would be used to dispose of dredged material off site.

Table 4.3-2 (above) provides criteria air pollutant emissions during construction of the offshore intake and diffuser system, and Lease Modification Project operations and maintenance.

Emissions from marine vessels or boats, equipment on the vessels/barges, and construction worker trips, which would be in addition to similar types of construction emissions for the HB Desalination Plant, are as follows (Dudek 2017).

- Project-related NOx emissions would be up to 73.85 pounds per day (lb/day).
- These emissions would combine with HB Desalination Plant construction emissions, which on their own would exceed the NOx daily threshold. Construction emissions for the HB Desalination Plant would occur at a daily rate ranging from approximately 39 to 182 lb/day of NOx, depending on various phases of activity over a 3-year period.[32]
- Under a worst-case scenario, the Lease Modification Project construction activities represent approximately a 40 percent increase over the total onshore construction emissions.

Construction-phase emissions from the proposed modifications would not be significant on their own, but would contribute to and worsen the significant unavoidable impact of NO_x emissions during construction of the HB Desalination Plant.

The analysis in the 2010 FSEIR identified a significant and unavoidable impact to regional air quality during construction of the HB Desalination Plant because construction emissions would exceed the daily threshold for NO_x. Construction-phase emissions for the HB Desalination Plant would be reduced, as required by the following 2010 FSEIR mitigation measures (MMs):

- **2010 MM CON-10** (Dust Suppression)
- **2010 MM CON-11** (Hauling Activities)

[32] The 2010 FSEIR quantified the criteria air pollutant emissions for the 2010 Project using the URBEMIS 2007 Version 9.2 model that is now considered out of date. For comparison purposes, the 2010 Project construction emissions considered in this air quality analysis were recalculated ("updated") using CalEEMod Version 2012.3.2.2 with updated default load factors and engine horsepower, but the same inputs and assumptions that were used in the 2010 FSEIR. Lease Modification Project emissions were then added to the 2010 Project emissions to determine the significance of the HB Desalination Plant as a whole (onshore and offshore emissions).

- **2010 MM CON-12** (Construction Equipment Maintenance)
- **2010 MM CON-13** (Architectural Coating ROG Emission Reduction)
- **2010 MM CON-14** (Diesel Fuel Reduction Plan)

However, after implementing the 2010 adopted mitigation measures, overall NO_x emissions during construction would exceed the significance thresholds. This exceedance is exacerbated by additional emissions from the Lease Modification Project; the impact remains significant and unavoidable.

Operation and Maintenance. The Lease Modification Project would change the configuration of the existing intake and discharge structures. With the addition of the wedgewire screens, energy consumption for operation of the HB Desalination Plant would increase by 1 to 3 percent, but the overall energy use of the HB Desalination Plant would be within the range analyzed in the 2010 FSEIR. The emissions associated with electricity generation for the HB Desalination Plant would not change.

Over the longer-term period of operation of the intake and discharge structures, maintenance to manually inspect/clean the offshore wedgewire intake screens would require a small number of worker vehicle trips and use of a crew boat during one or two days every two months (Dudek 2017).

The maximum daily operation and maintenance emissions for the new intake screens and discharge diffuser are shown in Table 4.3-2 above. Additional worker trips for periodic maintenance and use of the crew boat to transport divers to the wedgewire intake screens would result in emissions that would not be significant on their own. As defined in the 2010 FSEIR, the operation and maintenance emissions due to mobile sources associated with the desalination facility itself would also not result in substantial additions of criteria air pollutant emissions. The emissions mobile sources for operation and maintenance of the new project components and the HB Desalination Plant combined would not be significant.

Mitigation Measures

Lease PRC 1980.1 includes **2010 MM CON-14** for NOx construction emissions, which can feasibly be amended to apply to Lease Modification Project diesel fuel use.

MM CON-14a: Diesel Fuel Reduction Plan (Offshore Waters). Poseidon shall add an addendum to the Huntington Beach Desalination Plant "Diesel Fuel Reduction Plan" (included as a condition in Lease PRC 1980.1) to identify the actions to be taken to reduce diesel fuel emissions during offshore construction activities. The addendum, which shall be submitted to California State Lands Commission staff for review and approval, shall include at a minimum the following measures related to use of diesel powered equipment:

- Use diesel powered equipment meeting Tier ~~2~~ 4 CARB/U.S. EPA or higher emissions standards to the maximum extent feasible; if not already supplied

with a factory-equipped diesel particulate filter, all off-road diesel-powered construction equipment shall be outfitted with BACT devices certified by CARB

- Use 2010 model year diesel haul trucks or newer for material delivery and soil import/export activities
- Use marine vessel engines that are model year 2009 or newer, and thus compliant with Tier 3 marine compression-ignition standards
- Use portable construction equipment registered with the State's portable equipment registration program
- Use low sulfur diesel fuel and minimize idle time
- Ensure all heavy duty diesel powered vehicles comply with state and federal standards applicable at time of purchase
- Use diesel oxidation catalyst and catalyzed diesel particulate filters or other approved emission reduction retrofit devices installed on applicable construction equipment used during individual projects
- Consider other measures such as incentives and/or phase-in schedules for clean trucks during the construction period to ensure that equipment achieves the lowest emissions commercially available at the time of construction

Poseidon shall also submit the following plan to minimize emissions from any internal combustion engines associated with construction, operations, or maintenance.

MM CON-14b: Internal Combustion Engine Emissions Reduction Plan (Offshore Waters). ~~Prior to~~ At least 120 days before the start of construction, Poseidon shall submit to California State Lands Commission staff an Internal Combustion Engine Emissions Reduction Plan that contains, at a minimum the following measures:

- ~~Where feasible, u~~Use equipment powered by sources that have lowest emissions commercially-available at the time of construction, or equipment powered by electricity if such equipment is commercially available at the time of construction
- Use equipment with smallest engine size commercially-available and capable of completing project goals to reduce overall emissions
- Minimize idling time and unnecessary operation of internal combustion engine powered equipment

Residual Impact

Emissions of NOx from the 2010 Project exceeded SCAQMD thresholds, even after implementation of adopted mitigation. The addition of construction emissions from the Lease Modification Project evaluated in this document would exacerbate that exceedance. This impact remains significant and unavoidable even with implementation of MMs CON-14a and CON-14b.

Impact AQ-2: Creation of Objectionable Odors Affecting a Substantial Number of People.

Lease Modification Project activities would create emissions offshore and would not affect a substantial number of people **(Less than Significant).**

Impact Discussion

The Lease Modification Project would not include sources of objectionable odors. Any odors associated with diesel use by construction equipment on the barge or operation of boats during construction or maintenance would be short-term, intermittent, dissipate quickly, and be localized to the work area.

Mitigation Measures

No mitigation measures were adopted in 2010 for odor control during onshore construction, and none are recommended for the Lease Modification Project.

Impact AQ-3: Consistency with Regional Air Quality Plan.

The Lease Modification Project would be consistent with regional air quality plans **(Less than Significant).**

Impact Discussion

The SCAQMD manages local air quality subject to CARB oversight and administers the air pollution control programs to ensure attainment and maintenance of ambient air quality standards. A project could be inconsistent with the applicable air quality management plan or attainment plan if it contributes to an increase in the frequency or severity of air quality violations, causes new violations, or exceeds build-out assumptions embedded within the applicable air quality plan. This is assessed by examining whether the Lease Modification Project could cause population and/or employment growth or an increase in vehicle miles traveled in excess of the growth forecasts included in the attainment plan.

The proposed modifications would not increase population or employment growth, and would generate only short-term and temporary increases in vehicle miles traveled. The long-term operation and maintenance of the proposed modifications would result in limited levels of operational emissions at levels that would not be inconsistent with the regional Air Quality Management Plan. Construction activities conducted in compliance with applicable SCAQMD rules and regulations would not contribute to an increase in the frequency or severity of air quality violations, or cause new violations. The proposed construction activities would not conflict with or obstruct attainment and maintenance of the ambient air quality standards or implementation of the applicable air quality plan. This impact would therefore be less than significant.

Mitigation Measures

No mitigation measures were adopted in 2010 for conflicts with the applicable air quality management plan, and none are recommended for the Lease Modification Project modifications.

4.3.5 Cumulative Impacts

Impact CMLTV-AQ-1: Cumulative Air Emissions from Construction

Construction would increase cumulative emissions in onshore and offshore areas **(Significant and Unavoidable).**

Impact Discussion

As noted above, in 2010 the CSLC found that there would be significant and unavoidable cumulative short-term impacts to air quality from NOx emissions during construction of the HB Desalination Plant and the other cumulative projects even with incorporation of mitigation. This Finding was based on the 2010 FSEIR conclusion that the maximum overlapping daily construction emissions for the HB Desalination Plant and other projects with overlapping construction schedules would exceed the SCAQMD CEQA thresholds for NOx. The analysis for this Supplemental EIR has been updated to consider current projects and the location of the Lease Modification Project.

Because construction air quality impacts tend to have a noticeable localized effect in addition to their contribution to the overall regional air basin, projects in close proximity to the Lease Modification Project site were evaluated for short-term, construction-related impacts. Lease Modification Project-related emissions and emissions from other area projects (listed in Table 3-1, *Relevant Cumulative Projects in HB Desalination Plant Area*, in Section 3, *Cumulative Projects*) would also create temporary air quality impacts from construction, including vehicle emissions of nonattainment pollutants and precursors. The pollutants generated from construction of these projects could result in an impact on ambient air quality that would overlap with those of the proposed project if the construction work occurs in close proximity and at the same time. Therefore, short-term, construction-related air quality impacts, including the Lease Modification Project's contribution to those impacts, are considered significant and unavoidable.

The regional air quality impact of the Lease Modification Project would occur only during the limited duration of combined construction-phase emissions with construction of the HB Desalination Plant. The Lease Modification Project would not generate construction-phase emissions in excess of significance thresholds and would not include any permanent stationary sources of emissions. Construction emissions of the Lease Modification Project would cease after installation of the intake screens and discharge diffuser. Additionally, the Lease Modification Project would not induce population and/or

employment growth that could conflict with or obstruct either attainment or maintenance of the ambient air quality standards or implementation of the applicable air quality plan. Therefore, the construction and operation of the Lease Modification Project would not contribute to a cumulatively considerable long-term or regional air quality impact.

Mitigation Measures

The following mitigation measures also apply to cumulative impacts.

MM CON-14a: Diesel Fuel Reduction Plan (Offshore Waters).

MM CON-14b: Internal Combustion Engine Emissions Reduction Plan (Offshore Waters).

Residual Impact

The cumulative impact of Lease Modification Project construction activities remains significant and unavoidable even after implementation of MMs CON-14a and CON-14b.

4.3.6 Mitigation Measure/Applicant Proposed Measure Summary

Table 4.3-3 summarizes any mitigation measures or Applicant Proposed Measures (APMs) identified in this Supplemental EIR, or those adopted for the 2010 Project if also applicable, to reduce or avoid potential significant impacts associated with the Lease Modification Project.

Table 4.3-3. Impact and MM/APM Summary

Impact	MM/APM
2010 Project	
Mitigation measures required in the 2010 FSEIR addressed onshore construction and operation activities. • **2010 MM CON-10** (Dust Suppression) • **2010 MM CON-11** (Hauling Activities) • **2010 MM CON-12** (Construction Equipment Maintenance) • **2010 MM CON-13** (Architectural Coating ROG Emission Reduction) • **2010 MM CON-14** (Diesel Fuel Reduction Plan)	
Lease Modification Project	
AQ-1: Air Emissions from Construction	**MM CON-14a**: Diesel Fuel Reduction Plan (Offshore Waters) **MM CON-14b**: Internal Combustion Engine Emissions Reduction Plan (Offshore Waters)
AQ-2 Creation of Objectionable Odors Affecting a Substantial Number of People	~~No new mitigation measures~~ None recommended
AQ-3: Consistency with Regional Air Quality Plan	~~No new mitigation measures~~ None recommended
CMLTV-AQ-1: Cumulative Air Emissions from Construction	**MM CON-14a**: Diesel Fuel Reduction Plan (Offshore Waters) **MM CON-14b**: Internal Combustion Engine Emissions Reduction Plan (Offshore Waters)

4.4 CULTURAL RESOURCES

In 2010, the city of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), analyzed impacts to cultural resources associated with construction and operation of the Huntington Beach Desalination Plant (HB Desalination Plant or 2010 Project) in Section 4.9 (Construction-Related Impacts) of its certified Final Subsequent Environmental Impact Report (2010 FSEIR). In 2016, Poseidon Resources (Surfside) LLC (Poseidon) submitted an application to the California State Lands Commission (CSLC) to amend Lease PRC 1980.1 to install, operate, and maintain wedgewire screens and a multiport diffuser on the offshore ends of the existing AES Huntington Beach Generating Station (HBGS) seawater intake and discharge pipelines (hereinafter referred to as the Lease Modification Project). This Supplemental EIR analyzes impacts to cultural resources associated with the proposed Lease Modification Project activities for the following reasons.

- The 2010 Project did not include the offshore construction activities that are contemplated in Poseidon's 2016 application.
- The 2010 FSEIR did not address potential impacts to cultural resources associated with construction in the Pacific Ocean offshore the City.

Section 4.4 identifies cultural resources in the Lease Modification Project area, evaluates the type and significance of potential impacts based on anticipated changes to existing conditions, and recommends measures if necessary to avoid or reduce significant impacts. The impact area evaluated includes areas near the seaward end of PRC 1980.1 where subsurface anchoring, dredging, riprap reconfiguration, and pile-driving activities are proposed.

4.4.1 Environmental Setting

4.4.1.1 Historical and Unique Archaeological Resources

Fifteen cultural resources studies have been conducted within a 1-mile radius of the HB Desalination Plant site. None provided any evidence of historical resources or unique archaeological resources (as defined in Pub. Resources Code, § 21083.2) on the facility site. One cultural resource, CA-ORA-1531, is recorded onshore within 1 mile of the proposed HB Desalination Plant. The site was identified as containing a prehistoric shell midden. If any ancient prehistoric settlements were present in the vicinity of the offshore construction site during the late Pleistocene and early Holocene, they may have been submerged by rising sea levels during the early and middle Holocene. Previous research in the region indicates the presence of a low density of prehistoric resources in the Lease Modification Project vicinity. These resources may be buried, or may at some time be exposed or damaged due to wave action and erosion.

The CSLC (2017) maintains a database of California shipwrecks. Shipwrecks are identified because they are considered to be historical resources that may be protected under state and federal law. The CSLC Shipwreck Database contains information taken from books, old newspapers, and other contemporary resources. The location information may not be precise, and not all shipwrecks are listed. Many ships were also either salvaged or re-floated. One shipwreck was identified 2.6 miles offshore the HBGS.

4.4.1.2 Paleontological Resources

The Lease Modification Project construction site is located at the northern end of the Peninsular Ranges Geomorphic Province, a 900-mile-long northwest-southeast-trending structural block extending from the Transverse Ranges in the north to the tip of Baja California in the south and including the Los Angeles Basin. This province is characterized by mountains and valleys situated roughly parallel to the San Andreas Fault. The total width of the province is approximately 225 miles, extending from the Colorado Desert in the east, across the continental shelf, to the four southernmost Channel Islands: Santa Barbara, Santa Catalina, San Clemente, and San Nicolas. It contains extensive pre-Cretaceous (more than 145 million years ago [Ma]) and Cretaceous (145 to 66 Ma) igneous and metamorphic rock covered by limited exposures of post-Cretaceous (less than 66 Ma) sedimentary deposits (International Commission on Stratigraphy 2016, Irvine Valley College 2017).

Fossils have not been found near the HB Desalination Plant site (California Energy Commission [CEC] 2014b). A search of the University of California (Berkeley) Museum of Paleontology's database on January 4, 2012, found no records for fossils within 1 mile of the HB Energy Project site. No further records of fossils within the City of Huntington Beach are known (CEC 2014b).

Of the five major geologic units within the region, only "Marine Beach Deposits" is relevant to the Lease Modification Project. These deposits date to the Late Holocene (less than 4,200 years ago). While fossils may be found in Marine Beach Deposits since they are formed in deposits subject to substantial movement, the fossils are usually not in either their original location or stratigraphic context. The relatively young age of these deposits also results in a lower incidence of plant and animal fossilization. Marine Beach Deposits are therefore considered to have no paleontological sensitivity.

While no known paleontological resources have been recorded in the Lease Modification Project area, scientifically significant paleontological resources have been recovered near the area and elsewhere in Southern California, but from older sediments. Therefore, the Lease Modification Project has minimal potential to yield paleontological resources.

4.4.2 Regulatory Setting

Appendix A summarizes relevant federal and state regulations related to cultural resources.

4.4.3 Significance Criteria

4.4.3.1 Historical and Unique Archaeological Resources

A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment (Pub. Resources Code, § 21084.1). State CEQA Guidelines section 15064.5 subdivision (b) provides significance threshold criteria for determining a substantial adverse change to the significance of a cultural resource:

- Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.

The significance of an historical resource is materially impaired when a project:

- Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources (CRHR); or
- Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources (pursuant to Pub. Resources Code, § 5020.1, subd. (k)) or its identification in an historical resources survey (meeting the requirements of Pub. Resources Code, § 5020.1, subd. (g)), unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by a lead agency for purposes of CEQA.

4.4.3.2 Paleontological Resources

An impact to a paleontological resource would be significant if it directly or indirectly destroys a unique paleontological resource or site or unique geologic feature.

4.4.4 Environmental Impact Analysis and Mitigation

2010 PROJECT

In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB Desalination Plant co-located and stand-alone operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted the following Findings and mitigation measures for cultural resources (Item 62, October 29, 2010).

> *The [2010 Project] may have adverse short-term construction related impacts in regards to cultural resources. However, changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the potential significant environmental effects identified in the [2010 FSEIR], including standard conditions, project design features and incorporation of mitigation measures CON-49 through CON-52. Less than significant impact with mitigation.*

The four mitigation measures for impacts to cultural and paleontological resources adopted by the City and CSLC are identified below.

2010 MM CON-49. Should buried historical/archaeological resources be discovered during excavation on the OC-44 proposed booster pump station site, all construction work in that area shall be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds

2010 MM CON-50. During excavation of 5 feet below ground surface or lower on the proposed OC-44 booster pump station site, a paleontological resource recovery program for Miocene invertebrate fossils shall be implemented. This program shall include, but not be limited to, the following:

- Monitoring by a qualified paleontological monitor of excavation in areas identified as likely to contain paleontological resources. The monitor shall be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments, which are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Monitoring may be reduced if the potentially fossiliferous units described herein are not encountered, or upon exposure are determined following examination by qualified paleontological personnel to have low potential to contain fossil resources.
- Preparation of recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.
- Identification and curation of specimens into a museum repository with permanent retrievable storage. The paleontologist should have a written repository agreement in hand prior to the initiation of mitigation activities.
- Preparation of a report of findings with appended itemized inventory of specimens. The report and inventory, when submitted to the appropriate

lead agency, would signify completion of the program to mitigate impacts to paleontological resources

2010 MM CON-51. A qualified paleontologist shall be retained to monitor grading operations at the proposed desalination facility site and, if necessary, to salvage scientifically significant fossil remains. The paleontologist shall have the authority to temporarily divert or direct grading efforts to allow evaluation and salvage of exposed fossils.

2010 MM CON-52. While it is not anticipated, in the case that human remains are found within the OC-44 booster pump station site, no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. The County coroner shall be notified within 24 hours of the discovery. If the County coroner determines that the remains are or are believed to be Native American, the California Native American Heritage Commission in Sacramento must be notified within 24 hours. In accordance with California Public Resources Code, Section 5097.98, the Native American Heritage Commission must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

SWRCB FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT (SED)

In its *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes*, the SWRCB (2015a) concluded:

> *The Desalination Amendment will not affect historical, archeological, or paleontological, geologic features or human remains because the scope of the water board action relates to intake of seawater and discharge of brine that would occur or be located in the coastal ocean environment. As determined on a case-by-case basis, desalination facilities may adversely impact cultural resources. However, these impacts would not be caused directly or indirectly by the State Water Board's Desalination Amendment.*

The SWRCB (2015a) also noted:

> *No cultural resources were identified on the Huntington Beach project site project and no historical or archaeological resources are known to exist within or surrounding the proposed booster pump station sites. As a result, impacts to cultural resources were determined to be less than significant though mitigation consisting of monitoring, which is required during earthwork. (City of Huntington Beach 2010)*

ENVIRONMENTAL IMPACT ANALYSIS – LEASE MODIFICATION PROJECT

Proposed Lease Modification Project elements consist of offshore construction activities required to install wedgewire screens and a multiport diffuser on the HBGS pipelines, reduction in seawater intake volume (to 127 MGD for co-located and 106.7 MGD for stand-alone) through the new screens, and operation and maintenance of the screens and diffuser. Table 4.4-1 at the end of this section summarizes potential impacts and proposed mitigation measures.

Impact CUL-1: Change in Significance of Previously Recorded Historical or Unique Archaeological Resources.

There are no known cultural resources located in the Lease Modification Project area that are listed in or eligible for listing in the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR) or local register of historical resources (**No Impact**)**.**

Impact Discussion

Results of cultural resources records searches indicate that no known historical resources or archaeological resources are present near the Lease Modification Project offshore site that are listed in or eligible for listing in the NRHP, the CRHR, or a local register of historical resources. The single cultural resource recorded within 1 mile of the site is located onshore and would not be disturbed by offshore construction activities.

The CSLC's Shipwreck Database (consulted in February 2017) revealed only one shipwreck within 3 miles of the Lease Modification Project area: the NSK #2. This barge, which was built in 1918 sand later damaged by fire and sunk in 1934, is located about 2.6 miles offshore of the HBGS, well beyond the area that could be affected by construction of the Lease Modification Project.

Mitigation Measures

No impacts to previously recorded historical or unique archaeological resources, including shipwrecks would occur, so no mitigation is required.

Impact CUL-2: Change in Significance of Previously Unidentified Historical or Unique Archaeological Resources.

Inadvertent disturbance or destruction of a presently unidentified cultural resource could result in a change to the significance of the resource, if determined to be eligible for listing in the NRHP or CRHR (**Less than Significant with Mitigation**)**.**

Impact Discussion

A review of previous cultural resources surveys and site reports did not identify any reports of historical or archaeological resources in the Lease Modification Project area or its immediate surroundings. During construction, anchors and ~~potentially~~ buoys would be placed on the seafloor at the construction site to retain the construction barge and crew, supply, and maintenance vessels onsite. Ground disturbance would also occur during dredging and excavation for the piles supporting the wedgewire screens; although these sediments were likely disturbed when the intake structure was initially installed, all ground disturbing activities that extend more than 3 feet below the ground surface, such as dredging and pile driving, have the potential to cause adverse direct and indirect impacts to presently unidentified cultural resources, including Tribal cultural resources (discussed in Section 4.6, *Tribal Resources–Cultural*). The partial or complete disturbance or destruction of a resource could directly alter the significance of the resource and affect its eligibility to the NRHP or CRHR. Indirect changes that alter the setting, context, feeling, or integrity of the resource would occur if the resource was disturbed or destroyed. Therefore, construction activities involving offshore soil disturbance 3 feet or more below the ground surface would have the potential to directly or indirectly affect presently unidentified cultural resources.

Applicant Proposed Measure (APM)

Poseidon has committed to implement the following APM (see Section 2.5, *Applicant Proposed Measures*, and Table 4.02 in Section 4.0, *Environmental Setting and Impact Analysis*), that would also help minimize impacts of ground disturbance during construction to cultural resources.

APM-6. Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map (see Section 4.1, Ocean Water Quality and Marine Biological Resources)

Anchor locations would be carefully selected, after geophysical surveys, so that they are placed on unobstructed soft substrate. Reconfiguration of the existing ripap around the intake and discharge pipeline towers would also result in side-casting of riprap in locations identified on a Preclusion Map.

Mitigation Measures

With implementation of APM-6, the impact related to cultural resources would be reduced, but not to a less-than-significant level. **2010 MM CON-49** is required as a lease condition in PRC 1980.1, as amended by the Commission in 2010, ~~although~~ but is not relevant to the offshore Lease Modification Project since it applies to an onshore booster pump station site. Implementation of **MMs CUL/TCR-2a and CUL/TCR-2b** would ensure any geophysical surveys associated with APM-6 are adequate for

identification of cultural resources, provide qualified review of the surveys for identification, and ensure proper management of any discoveries of previously unidentified historical or unique archaeological resources. These mitigation measures create a plan to identify, treat and evaluate newly discovered resources. With implementation of MM CUL/TCR-2a and MM CUL/TCR-2b, the risk to undiscovered resources would be reduced to a less-than-significant level.

MM CUL/TCR-2a: Cultural Resource Identification during Geophysical Surveys. Poseidon shall ensure that a qualified maritime archaeologist (e.g., one who meets Secretary of the Interior Professional Qualifications Standards defined in Code of Federal Regulations, section 36, part 61), approved by California State Lands Commission (CSLC) staff, participates in the development and implementation of the geophysical surveys conducted to develop the Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map. The archaeologist shall identify any cultural resources found during the surveys, and prepare a summary report to be submitted to CSLC staff.

MM CUL/TCR-2b: Discovery of Previously Unidentified Cultural or Tribal Cultural Resources. If potentially significant archaeological or Tribal cultural resources are discovered any time during the Lease Modification Project geophysical surveys, construction, and operation activities, work within 250 feet of the find shall be temporarily suspended or redirected away from the discovery until the Applicant has notified California State Lands Commission (CSLC) staff and any local, State, or Federal agency with approval or permitting authority over the Lease Modification Project that has requested/required notification. Notification shall occur within 48 hours of discovery and be consistent with guidelines for Tribal involvement as stated in the CSLC Tribal Policy (www.slc.ca.gov/About/Tribal.html). The Applicant shall retain a CSLC-approved archaeologist and request a culturally affiliated Tribal representative to evaluate the nature and significance of the discovery. In addition, the following shall apply:

- Impacts to previously unknown significant archaeological or Tribal cultural resources shall be avoided through preservation in place if feasible.
- Damaging effects to Tribal cultural resources shall be avoided or minimized following the measures identified in Public Resources Code section 21084.3, subdivision (b), unless other measures are mutually agreed to by the lead archaeologist and culturally affiliated Tribal representative that would be as or more effective.
- If Tribal cultural resources cannot be avoided, a Treatment Plan developed by the archaeologist and the culturally affiliated Tribal representative, shall be submitted to CSLC staff for review and approval prior to further disturbance of the area. The plan shall:
    - state requirements for professional qualifications of all cultural resources specialists and Tribal cultural resource workers

- identify appropriate methods of resource recording, artifact cataloguing, and analyses
- determine appropriate levels of recovery and/or stabilization of resources
- provide documentation of a curatorial facility or museum that will be responsible for the permanent preservation of any unique or sensitive cultural materials resulting from site recovery and/or stabilization efforts

- If the lead archaeologist and the culturally affiliated Tribal representative believe that damaging effects to archaeological or Tribal cultural resources will be avoided or minimized, then work in the area may resume.

Impact CUL-3: Construction or operation of the Lease Modification Project could damage or destroy paleontological resources.

Project construction and operation would occur offshore in an area where there is low potential for paleontological resources to be affected **(Less than Significant).**

Impact Discussion

No scientifically significant paleontological resources have been identified in the coastal alluvial sediments within the offshore Lease Modification Project area, although the region does encompass deposits with high sensitivity onshore. As discussed in Impacts CUL-1 and CUL-2, anchoring, dredging, riprap reconfiguration pile driving, and wedgewire screen and diffuser installation would disturb seafloor sediments in the construction area. In contrast, Lease Modification operations and maintenance are unlikely to result in significant ground disturbance.

Applicant Proposed Measure (APM)

APM-6, Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map, identified above would help to minimize impacts of ground disturbance during construction to paleontological resources.

Mitigation Measures

The following mitigation measures are required as part of the City's and CSLC's approval of the 2010 Project but are not relevant to the offshore Lease Modification Project since they apply to onshore construction activities:

- **2010 MM CON-50** (Paleontological Resource Recovery Program)
- **2010 MM CON-51** (Qualified Paleontologist)

~~However, d~~Due to the low likelihood of discovery of paleontological resources in the offshore coastal alluvial sediments, and with implementation of APM-6, no additional

mitigation measures for offshore construction, operation, or maintenance of the Lease Modification Project are required.

Impact CUL-4: Disturb Unidentified Human Remains.

Human remains have not been identified within the Lease Modification Project area; however, ground disturbing activities could adversely impact presently unidentified human remains, including those interred outside of dedicated cemeteries (**Less than Significant with Mitigation**).

Impact Discussion

A review of previous archaeological surveys and site reports did not identify any reports of human remains in the offshore Lease Modification area or its immediate surroundings. However, previously unidentified human remains could be found. If human remains or related resources are discovered, such resources shall be treated in accordance with State and local law, regulations and guidelines that govern the disclosure, recovery, relocation, and preservation of human remains (State CEQA Guidelines, § 15064.5, subd. (e)). Implementation of MM CUL-4/TCR-4 would ensure that adverse effects resulting from the inadvertent discovery of human remains would be less than significant.

Mitigation Measures

The following mitigation measure is required as part of the City's and CSLC's approval of the 2010 Project, but is specific to the onshore booster pump station site:

- **2010 MM CON-52** (Discovery of Human Remains during Excavation).

While not anticipated, if human remains are found within the offshore Lease Modification Project site, the following additional mitigation measure shall be implemented.

MM CUL-4/TCR-4: Appropriate Treatment of Human Remains. In accordance with Health and Safety Code section 7050.5 and Public Resources Code section 5097.98, if human remains are found, all ground disturbing activities shall halt within 165 feet (50 meters) of the discovery. The Applicant must contact the County Coroner and California State Lands Commission (CSLC) staff within 24 hours of the discovery. No further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie potential remains shall occur until the County Coroner has determined whether the remains are subject to his or her authority. The County Coroner must make this determination within 2 working days of notification of the discovery pursuant to Health and Safety Code section 7050.5 subdivision (b). If the County Coroner determines that the remains do not require an assessment of cause of death and that the remains are, or are believed to be Native American, the Coroner must notify the Native American Heritage Commission (NAHC) by telephone

within 24 hours. In accordance with Public Resources Code section 5097.98, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) of the deceased Native American. The MLD shall complete their inspection and make recommendations within 48 hours of being granted access to the site. The MLD may recommend means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. CSLC staff will discuss and confer with the MLD regarding their recommendations pursuant to Public Resources Code section 5097.98 subdivisions (b) and (c).

4.4.5 Cumulative Impacts

The 2010 FSEIR concluded that the HB Desalination Plant would not result in any cumulatively considerable contribution to any significant cultural resources after performing a records search, literature review, and field survey. The analysis for this Supplemental EIR has been updated to consider current projects and the location of the Lease Modification Project. Table 3-1, in Section 3, *Cumulative Projects*, presents the list of cumulative projects within the Lease Modification Project area.

Impacts to cultural and paleontological resources related to cumulative development within the areas surrounding the offshore construction site could be significant if significant cultural resources are destroyed by development. Since there are no known historical resources, unique archaeological, or paleontological resources at the offshore construction site or its nearby vicinity, the Lease Modification Project would not contribute to cumulative impacts to those resources. No projects in the cumulative impact study area would occur offshore in a location where they could combine with the Lease Modification Project activities to create a cumulatively considerable impact to cultural and paleontological resources potentially located offshore. Overall, the Lease Modification Project would not would not represent a cumulatively considerable contribution to any significant cumulative impact.

4.4.6 Mitigation Measure/Applicant Proposed Measure Summary

Table 4.4-1 presents the mitigation measures from the 2010 FSEIR and indicates whether each mitigation measure is also applicable to the Lease Modification Project.

Table 4.4-1. Impact and MM/APM Summary

Impact	MM/APM
2010 Project	
Mitigation measures required in the 2010 FSEIR addressed onshore construction and operation activities. • **2010 MM CON-49** (Discovery of Buried Historical/ Archaeological Resources During Excavation) • **2010 MM CON-50** (Paleontological Resource Recovery Program) • **2010 MM CON-51** (Qualified Paleontologist to Monitor Grading Operations) • **2010 MM CON-52** (Discovery of Human Remains During Excavation)	
Lease Modification Project	
CUL-1: Change in Significance of Previously Recorded Historical or Unique Archaeological Resources	**APM-6**: Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map None recommended
CUL-2: Change in Significance of Previously Unidentified Historical or Unique Archaeological Resources	**APM-6**: see above **MM CUL/TCR-2a:** Cultural Resource Identification During Geophysical Surveys **MM CUL/TCR-2b:** Discovery of Previously Unidentified Cultural or Tribal Cultural Resources
CUL-3: Construction or operation of the Lease Modification Project could damage or destroy paleontological resources	**APM-6**: see above No new mitigation measures recommended
CUL-4: Disturb Unidentified Human Remains	**MM CUL-4/TCR-4**: Appropriate Treatment of Human Remains

4.5 CULTURAL RESOURCES − TRIBAL

As discussed in Section 4.4, *Cultural Resources*, of this Supplemental Environmental Impact Report (EIR), in 2010, the city of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), analyzed impacts to cultural resources associated with construction and operation of the Huntington Beach Desalination Plant (HB Desalination Plant or 2010 Project) in Section 4.9 (Construction-Related Impacts) of its certified Final Subsequent EIR (2010 FSEIR). A number of relevant events have occurred since 2010.

- In 2014, Assembly Bill (AB) 52 (Gatto; Stats. 2014, ch. 532) was enacted, which set forth procedural and substantive requirements for analysis of Tribal cultural resources and consultation with California Native American Tribes, as defined.
- In 2016, the CSLC (2016) adopted a Tribal Policy in order to provide guidance and consistency in the CSLC's interactions with California Native American tribes (see www.slc.ca.gov/About/Tribal.html). The Policy, which was developed in collaboration with Tribes, other agencies, and the Governor's Tribal Advisor, recognizes that Tribes have a connection to areas that may be affected by CSLC actions and "that these Tribes and their members have unique and valuable knowledge and practices for conserving and using these resources sustainably."
- In 2016, Poseidon Resources (Surfside) LLC (Poseidon) submitted an application to the California State Lands Commission (CSLC) to amend Lease PRC 1980.1 to install, operate, and maintain wedgewire screens and a multiport diffuser on the offshore ends of the existing AES Huntington Beach Generating Station (HBGS) seawater intake and discharge pipelines (hereinafter referred to as the Lease Modification Project).

This Supplemental EIR analyzes impacts to Tribal cultural resources associated with the proposed Lease Modification Project activities for the following reasons.

- The 2010 Project did not include the offshore construction activities that are contemplated in Poseidon's 2016 application.
- The 2010 FSEIR did not address potential impacts to Tribal cultural resources associated with construction in the Pacific Ocean offshore the City and Huntington State Beach.

Section 4.5 summarizes Tribal cultural resources in the Lease Modification Project area, evaluates the type and significance of potential impacts based on anticipated changes to existing conditions, and recommends measures if necessary to avoid or reduce significant impacts (see also Section 4.4, *Cultural Resources*). The impact area evaluated includes areas near the seaward end of PRC 1980.1 where anchoring, dredging, riprap reconfiguration, and pile-driving activities are proposed.

4.5.1 Environmental Setting

The environmental setting for Tribal cultural resources incorporates by reference information from both the California Energy Commission (CEC 2014b) Final Staff Assessment for the Huntington Beach Energy Project (HB Energy Project) and the 2010 FSEIR. Consistent with its adopted Tribal Policy, the CSLC initiated outreach with California Native American tribes about sensitive and valued Tribal cultural resources that may be affected by the Lease Modification Project, but has not been contacted to date.

According to the CEC (2014b), the Gabrielino people and representative tribes are most directly affiliated with the vicinity of the HBGS. There are at least four subgroups of the Gabrielino: those of the Los Angeles Basin, those of the northern mountainous area (including the inland San Fernando Valley), those of the Santa Catalina and San Clemente islands, and those of San Nicolas Island. In the present day, the Gabrielino people prefer the names Gabrielino, Tongva, or Gabrielino Tongva to refer to their people collectively (CEC 2014b). The territory boundary of the Gabrielino Tongva is roughly bounded by the San Gabriel Mountains to the north, the Santa Monica Mountains to the west, the mouth of the Aliso Creek to the south, and the Santa Ana Mountains to the east. The territory includes most if not all of the San Gabriel Mountains; the three ocean islands of San Nicolas, San Clemente, and Santa Catalina; and the ocean waters surrounding the islands and between the islands and the mainland (CEC 2014b).

The HB Desalination Plant would be located in the southwestern portion of the Gabrielino's mainland territory. A Gabrielino Tongva tribal website (Tongva People 2017) provided the general locations of nearby village locations along the coastline in the vicinity of the HB Desalination Plant site. One village, called Lukupangna, was located in Huntington Beach near the mouth of the Santa Ana River. Other nearby villages were located in Newport Beach and the Bolsa Chica Reserve in Huntington Beach. The primary ethnographic villages were likely located on the higher mesa areas above the bay and related estuary and marsh lands. Villages located along the beaches were likely used as camps when marine resources were gathered. The coastline territorial boundary of the Gabrielino Tongva has since changed due to shifting ocean depths and related sand deposits. As a result, this coastal area of California is known for containing offshore buried/submerged archaeological deposits (CEC 2014b).

4.5.1.1 Definition of Tribal Resources

Tribal cultural resources, as defined by California Environmental Quality Act (CEQA) section 21074, subdivision (a)(1)-(2), include either of the following:

9. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

(A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.

(B) Included in a local register of historical resources as defined in Public Resources Code section 5020.1, subdivision (k).

10. A resource determined by the [CEQA] agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in Public Resources Code section 5024.1, subdivision (c). In applying the criteria set forth in subdivision (c) of section 5024.1 for the purposes of this paragraph, the [CEQA] agency shall consider the significance of the resource to a California Native American tribe.

Assembly Bill 52 (Stats. 2014, ch. 532) establishes that California Native American tribes that are traditionally and culturally affiliated with a geographic area can provide lead agencies with expert knowledge of tribal cultural resources (Pub. Resources Code, § 21080.3.1, subd. (a)).

4.5.1.2 Tribal Coordination

The "Phase I Cultural Resources Assessment for the Poseidon Seawater Desalination Project" (Appendix J of the 2010 FSEIR) documented that the Native American Heritage Commission's (NAHC) Sacred Lands File search yielded no positive results for Native American cultural resources in the immediate 2010 Project area. Outreach letters were mailed to 13 Tribal members identified by the NAHC. The letters included a description of the Lease Modification Project and known cultural resources on the HBGS/proposed HB Desalination Plant property, none of which are located within the offshore footprint of the Lease Modification Project (PRC 1980.1). No responses were received.

Although the Consultation notification provisions of AB 52 are not applicable because the CSLC is acting as a CEQA responsible agency for the Lease Modification Project, CSLC staff contacted the Tribal Chairpersons identified by the NAHC to ensure the Tribes had an opportunity to provide meaningful input on the potential for Tribal cultural resources to be found in the area, and what steps should be taken to ensure adverse impacts to Tribal cultural resources are avoided. Per the CSLC's Tribal Policy, the CSLC reached out to local Tribes and Native American groups as discussed below.

The CSLC requested NAHC's Sacred Lands File search. The response from the NAHC, received on December 14, 2016, indicated no known presence of Native American Tribal cultural resources in the immediate Lease Modification Project area. The CSLC used the Native American Contacts List provided by the NAHC to develop an outreach list and, on March 22, 2017, sent an outreach letter to the following Tribes:

- Gabrielino-Tongva Tribe
- Gabrielino Tongva Indians of California Tribal Council
- Gabrielino/Tongva Nation

- Gabrielino/Tongva San Gabriel Band of Mission Indians
- Gabrielino Band of Mission Indians – Kizh Nation

Each individual on the list was sent an informational letter with a description of the Lease Modification Project, a map of the existing lease area, and schematics for the intake and discharge pipeline modifications. No responses were received.

4.5.1.3 Tribal Cultural Resources

The 2010 FSEIR reported that 15 archaeological studies had been conducted within a mile radius of the proposed desalination facility site. No cultural resources were identified on or near the HB Desalination Plant site. However, because that project analysis pre-dated AB 52, it did not specifically address Tribal cultural resources.

4.5.2 Regulatory Setting

Appendix A summarizes relevant federal and state regulations related to tribal cultural resources.

4.5.3 Significance Criteria

The 2010 FSEIR did not include any distinct significance criteria to evaluate Tribal cultural resources. As indicated in Section 4.4, *Cultural Resources*, the City incorporated tribal resources as a component of the 2010 FSEIR's cultural resources impact analysis. Assembly Bill 52 (Stats. 2014, ch. 532), which became effective on July 1, 2015, made several changes to CEQA regarding Tribal cultural resources, including specific language regarding thresholds of significance. With respect to significance determinations, Public Resources Code section 21084.2 states, "A project with an effect that may cause a substantial adverse change in the significance of a Tribal cultural resource is a project that may have a significant effect on the environment." Agencies are further directed to avoid damaging effects to Tribal cultural resources, when feasible. If measures are not otherwise identified in consultation with affected Tribes to mitigate a substantial adverse change to a Tribal cultural resource, the examples of measures provided in Public Resources Code section 21084.3 may be considered, if feasible. An impact to Tribal cultural resources would be significant if:

- The project would cause a substantial adverse change in the significance of a Tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:
    - Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1, subdivision (k), or

- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

The following is an analysis of the impacts relevant to the Lease Modification Project. For Tribal cultural resources, there would be no different effects from the two potential operational scenarios (co-located and stand-alone operations), so they are not addressed separately in this analysis.

4.5.4 Environmental Impacts and Mitigation Measures

2010 PROJECT

As noted in Section 1, Introduction and Section 4.4, Cultural Resources, in 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB Desalination Plant co-located and stand-alone operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted a Finding that short-term construction related impacts in regards to cultural resources would be less than significant with mitigation (Item 62, October 29, 2010). Of the four mitigation measures adopted by the CSLC, only **2010 Mitigation Measure (MM) CON-52** addressed Tribal issues.

2010 MM CON-52. While it is not anticipated, in the case that human remains are found within the OC-44 booster pump station site, no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. The County coroner shall be notified within 24 hours of the discovery. If the County coroner determines that the remains are or are believed to be Native American, the California Native American Heritage Commission in Sacramento must be notified within 24 hours. In accordance with California Public Resources Code, Section 5097.98, the Native American Heritage Commission must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

SWRCB FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT (SED)

The SWRCB (2015a) *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes,*

Brine Discharges, and the Incorporation of Other Non-Substantive Changes (SED) did not separately address Tribal cultural resources.

ENVIRONMENTAL IMPACT ANALYSIS – LEASE MODIFICATION PROJECT

Proposed Lease Modification Project elements consist of offshore construction activities required to install wedgewire screens and a multiport diffuser on the HBGS pipelines, reduction in seawater intake volume (up to 127 MGD for co-located and 106.7 MGD for stand-alone) through the new screens, and operation and maintenance of the screens and diffuser. Table 4.5-1 at the end of this section summarizes potential impacts and proposed mitigation measures.

Impact TCR-1: Change in Significance of Previously Recorded Tribal Cultural Resources.

There are no known Tribal cultural resources located in the Lease Modification Project area that are listed in or eligible for listing in the NRHP, CRHR, or local register of historical resources (**No Impact**).

Impact Discussion

No Tribal cultural resources (e.g., areas of spiritual significance, plant collection areas) are known to exist within the offshore Lease Modification Project area, and thus no Tribal cultural resources would be adversely impacted, either directly or indirectly, by activities occurring during the Lease Modification Project. The placement of laydown, staging, and storage areas would also not have a direct or indirect adverse effect since none of these areas contains known Tribal cultural resources.

Mitigation Measures

No mitigation measures are recommended.

Impact TCR-2: Change in Significance of Previously Unidentified Tribal Cultural Resources.

Inadvertent disturbance or destruction of a presently unidentified Tribal cultural resource could result in a change to the significance of the resource, if determined to be eligible for listing in the NRHP or CRHR (**Less than Significant with Mitigation**).

Impact Discussion

Tribal cultural resources can include specific places or landscapes that have value to a Native American tribe. Neither resource was identified for the 2010 Project area or for the two offshore locations where the wedgewire screens and the diffuser are proposed for installation. Subsurface dredging and pile driving would be required to install the intake screens, although most of this construction work would likely occur in sediments

that were disturbed when the intake structure was initially installed. Riprap would also be sidecast and replaced over a greater seafloor footprint than is currently covered. All ground disturbing activities that extend more than 3 feet below the ground surface, such as dredging and pile driving, have the potential to cause adverse direct and indirect impacts to presently unidentified Tribal cultural resources.

Therefore, construction activities involving offshore soil disturbance 3 feet below the ground surface would have the potential to directly or indirectly affect presently unidentified cultural resources.

Applicant Proposed Measure (APM)

Poseidon has committed to implement the following APM (see Section 2.5, *Applicant Proposed Measures*, and Table 4.02 in Section 4.0, *Environmental Setting and Impact Analysis*), that would also help minimize impacts of ground disturbance during construction to Tribal cultural resources.

APM-6. Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map (see Section 4.1, Ocean Water Quality and Marine Biological Resources)

Anchor locations would be carefully selected, after geophysical surveys, so that they are placed on unobstructed soft substrate. Reconfiguration of the existing ripap around the intake and discharge pipeline towers would also result in side-casting of riprap in locations identified on a Preclusion Map.

Mitigation Measures

With implementation of APM-6, the impact related to Tribal cultural resources would be reduced, but not to a less-than-significant level. **2010 MM CON-52** is required as a lease condition in PRC 1980.1, but is not relevant to the offshore Lease Modification Project since it applies to an onshore booster pump station site. Implementation of **MMs CUL/TCR-2a and CUL/TCR-2b** would ensure any geophysical surveys associated with APM-6 are adequate for identification of potential Tribal cultural resources, provide qualified review of the surveys for identification, and ensure proper management of any discoveries of previously unidentified Tribal cultural resources. These mitigation measures create a plan to identify, treat and evaluate newly discovered resources. With implementation of MM CUL/TCR-2a and MM CUL/TCR-2b, the risk to undiscovered resources would be reduced to a less-than-significant level.

MM CUL/TCR-2a: Cultural Resource Identification during Geophysical Surveys. Poseidon shall ensure that a qualified maritime archaeologist (e.g., one who meets Secretary of the Interior Professional Qualifications Standards defined in Code of Federal Regulations, section 36, part 61), approved by California State Lands Commission (CSLC) staff, participates in the

development and implementation of the geophysical surveys conducted to develop the Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map. The archaeologist shall identify any cultural resources found during the surveys, and prepare a summary report to be submitted to CSLC staff.

MM CUL/TCR-2b: Discovery of Previously Unidentified Cultural or Tribal Cultural Resources. If potentially significant archaeological or Tribal cultural resources are discovered any time during the Lease Modification Project geophysical surveys, construction, and operation activities, work within 250 feet of the find shall be temporarily suspended or redirected away from the discovery until the Applicant has notified California State Lands Commission (CSLC) staff and any local, State, or Federal agency with approval or permitting authority over the Lease Modification Project that has requested/required notification. Notification shall occur within 48 hours of discovery and be consistent with guidelines for Tribal involvement as stated in the CSLC Tribal Policy (www.slc.ca.gov/About/Tribal.html). The Applicant shall retain a CSLC-approved archaeologist and request a culturally affiliated Tribal representative to evaluate the nature and significance of the discovery. In addition, the following shall apply:

- Impacts to previously unknown significant archaeological or Tribal cultural resources shall be avoided through preservation in place if feasible.
- Damaging effects to Tribal cultural resources shall be avoided or minimized following the measures identified in Public Resources Code section 21084.3, subdivision (b), unless other measures are mutually agreed to by the lead archaeologist and culturally affiliated Tribal representative that would be as or more effective.
- If Tribal cultural resources cannot be avoided, a Treatment Plan developed by the archaeologist and the culturally affiliated Tribal representative, shall be submitted to CSLC staff for review and approval prior to further disturbance of the area. The plan shall:
    - state requirements for professional qualifications of all cultural resources specialists and Tribal cultural resource workers
    - identify appropriate methods of resource recording, artifact cataloguing, and analyses
    - determine appropriate levels of recovery and/or stabilization of resources
    - provide documentation of a curatorial facility or museum that will be responsible for the permanent preservation of any unique or sensitive cultural materials resulting from site recovery and/or stabilization efforts
- If the lead archaeologist and the culturally affiliated Tribal representative believe that damaging effects to archaeological or Tribal cultural resources will be avoided or minimized, then work in the area may resume.

While not anticipated, previously unidentified human remains could be found within the offshore Lease Modification Project site. Therefore, the following additional mitigation measure shall be implemented.

MM CUL-4/TCR-4: Appropriate Treatment of Human Remains. In accordance with Health and Safety Code section 7050.5 and Public Resources Code section 5097.98, if human remains are found, all ground disturbing activities shall halt within 165 feet (50 meters) of the discovery. The Applicant must contact the County Coroner and California State Lands Commission (CSLC) staff within 24 hours of the discovery. No further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie potential remains shall occur until the County Coroner has determined whether the remains are subject to his or her authority. The County Coroner must make this determination within 2 working days of notification of the discovery pursuant to Health and Safety Code section 7050.5 subdivision (b). If the County Coroner determines that the remains do not require an assessment of cause of death and that the remains are, or are believed to be Native American, the Coroner must notify the Native American Heritage Commission (NAHC) by telephone within 24 hours. In accordance with Public Resources Code section 5097.98, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) of the deceased Native American. The MLD shall complete their inspection and make recommendations within 48 hours of being granted access to the site. The MLD may recommend means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. CSLC staff will discuss and confer with the MLD regarding their recommendations pursuant to Public Resources Code section 5097.98 subdivision (b) and (c)

4.5.5 Cumulative Impacts

The 2010 FSEIR concluded that the HB Desalination Plant would not result in any cumulatively considerable contribution to any significant cultural resources after performing a records search, literature review, and field survey. The analysis for this Supplemental EIR has been updated to consider current projects and the location of the Lease Modification Project. Table 3-1, in Section 3, *Cumulative Projects*, presents the list of cumulative projects within the Lease Modification Project area.

Impacts to Tribal cultural resources related to cumulative development within the areas surrounding the offshore construction site could be significant if significant Tribal cultural resources are destroyed by development. Since there are no known Tribal cultural resources at the offshore construction site or its nearby vicinity, the Lease Modification Project would not contribute to cumulative impacts to those resources. No projects in the cumulative impact study area would occur offshore in a location where they could combine with the Lease Modification Project activities to create a cumulatively considerable impact to Tribal cultural resources potentially located offshore. Overall, the

Lease Modification Project would not ~~would not~~ represent a cumulatively considerable contribution to any significant cumulative impact.

4.5.6 Mitigation Measure/Applicant Proposed Measure Summary

Table 4.5-1 presents the mitigation measures from the 2010 FSEIR and indicates whether each mitigation measure is also applicable to the Lease Modification Project.

Table 4.5-1. Impact and MM/APM Summary

Impact	MM/APM
2010 Project	
Mitigation measures required in the 2010 FSEIR addressed onshore impacts~~; however, the following mitigation measure is also applicable to offshore activities.~~ • **2010 MM CON-52** (Discovery of Human Remains During Excavation)	
Lease Modification Project	
TCR-1: Change in Significance of Previously Recorded Tribal Cultural Resources	~~No new mitigation measures~~ None recommended
TCR-2: Change in Significance of Previously Unidentified Tribal Cultural Resources	**APM-6**: see above **MM CUL/TCR-2a:** Cultural Resource Identification During Geophysical Surveys **MM CUL/TCR-2b:** Discovery of Previously Unidentified Cultural or Tribal Cultural Resources **MM CUL-4/TCR-4**: Appropriate Treatment of Human Remains

4.6 GREENHOUSE GAS EMISSIONS

In 2010, the city of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), discussed greenhouse gas (GHG) emissions and impacts to climate change associated with construction and operation of the Huntington Beach Desalination Plant (HB Desalination Plant or 2010 Project) in Section 4.12 (Climate Change) of its certified Final Subsequent Environmental Impact Report (2010 FSEIR). In 2016, Poseidon Resources (Surfside) LLC (Poseidon) submitted an application to the California State Lands Commission (CSLC) to amend Lease PRC 1980.1 to install, operate, and maintain wedgewire screens and a multiport diffuser on the offshore ends of the existing AES Huntington Beach Generating Station (HBGS) seawater intake and discharge pipelines (hereinafter referred to as the Lease Modification Project). This Supplemental EIR analyzes GHG emissions generated during proposed Lease Modification Project activities for the following reasons.

- The 2010 Project did not include the offshore construction activities that are contemplated in Poseidon's 2016 application.
- The 2010 FSEIR did not address GHG emissions associated with construction in the Pacific Ocean offshore the City and Huntington State Beach.

This section evaluates the potential for the Lease Modification Project to generate GHG emissions, either directly or indirectly, in the region. Specifically, Section 4.6 describes expected GHG emissions from Lease Modification Project equipment and scheduling, evaluates the type and significance of potential impacts based on anticipated changes to existing conditions, and recommends measures if necessary to avoid or reduce significant impacts. The impact area evaluated includes areas near the seaward end of PRC 1980.1 where subsurface anchoring, dredging, riprap reconfiguration, and pile-driving activities are proposed, and along construction vessel routes.

4.6.1 Environmental Setting

4.6.1.1 Introduction

GHGs are defined as any gas that absorbs infrared radiation in the atmosphere. GHGs include, but are not limited to, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). These GHGs lead to the trapping and buildup of heat in the atmosphere near the earth's surface, commonly known as the greenhouse effect. There is overwhelming scientific consensus that human-related emissions of GHGs above natural levels have contributed significantly to global climate change by increasing the concentrations of the gases responsible for the greenhouse effect, which causes atmospheric warming above natural conditions.

According to the National Oceanic and Atmospheric Administration (NOAA), the atmospheric concentration CO_2 measured at Mauna Loa, Hawaii in May 2016 was 407.70 parts per million (ppm) (NOAA 2016) compared to the pre-industrial levels of 280 ppm +/- 20 ppm (Intergovernmental Panel on Climate Change [IPCC] 2007a). NOAA's Mauna Loa data also show that the mean annual CO_2 concentration growth rate is accelerating, where in the 1960s it was about 0.9 ppm per year and in the first decade of the 2000s it was almost 2 ppm per year, and from May 2015 to May 2016 it was nearly 4 ppm. Because GHG emissions are known to increase atmospheric concentrations of GHGs, and increased GHG concentrations in the atmosphere exacerbate global warming, a project that adds to the atmospheric load of GHGs adds to the problem. As a result, in order to avoid disruptive and potentially catastrophic climate change, annual GHG emissions must not only stabilize, but in fact must be substantially reduced. The impact to climate change due to the increase in ambient concentrations of GHGs differ from criteria pollutants (see Section 4.3, *Air Quality*), in that GHG emissions from a specific project do not cause direct adverse localized human health effects. Rather, the direct environmental effect of GHG emissions is the cumulative effect of an overall increase in global temperatures, which in turn has numerous indirect effects on the environment and humans.

The IPCC completed a Fifth Assessment Report (AR5) in 2014 that contains information on the state of scientific, technical, and socio-economic knowledge about climate change. The AR5 includes working group reports on basics of the science, potential impacts and vulnerability, and mitigation strategies.[33] Global climate change has caused physical, social, and economic impacts in California, such as land surface and ocean warming, decreasing snow and ice, rising sea levels, increased frequency and intensity of droughts, storms, and floods, and increased rates of coastal erosion. In its Climate Change 2014 Synthesis Report, which is part of the AR5, the IPCC (2014) notes:

> *Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems…warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen.*

The potential of a gas or aerosol to trap heat in the atmosphere is called global warming potential (GWP). The GWP of different GHGs varies because they absorb different amounts of heat. CO_2, the most ubiquitous GHG, is used to relate the amount of heat absorbed to the amount of the gas emissions; this is referred to as CO_2 equivalent (CO_2e). CO_2e is the amount of GHG emitted multiplied by the GWP. The GWP of CO_2, as the reference GHG, is 1. Methane has a GWP of 25; therefore, 1 pound of methane

[33] For additional information on the Fifth Assessment Report, see https://www.ipcc.ch/report/ar5/.

equates to 25 pounds of CO_2e. Table 4.6-1 shows a range of gases with their associated GWP, their estimated lifetime in the atmosphere, and the GWP over a 100-year timeframe (per federal and state reporting requirements).

Table 4.6-1. Global Warming Potential of Various Gases

Gas	Life in Atmosphere (years)	100-year GWP (average)
Carbon Dioxide	50-200	1
Methane	12	25
Nitrous Oxide	120	298
HFCs	1.5-264	12-14,800
Sulfur Hexafluoride	3,200	22,800

Source: U.S. Environmental Protection Agency (USEPA) 40 Code of Federal Regulations [CFR] Part 98, Subpart A, Table A-1, effective January 1, 2015. The 40 CFR Part 98 approach is used to estimate GHG emissions per million British Thermal Units, assuming 99.9 percent combustion efficiency (Appendix E).
Note: GWP = global warming potential; HFC = hydrofluorocarbon.

According to the Emission Database for Global Atmospheric Research (European Commission Joint Research Centre [European Comission] 2016), the estimated global emissions in 2012 were 53,937 million metric tons of CO_2e ($MMTCO_2e$), and the U.S. Environmental Protection Agency (USEPA 2014) estimates U.S. emissions were approximately 6,525 $MMTCO_2e$. In California, the California Air Resources Board (CARB) is the primary agency responsible for providing information on implementing the GHG reductions required by the State pursuant to Assembly Bill (AB) 32 (CARB 2014), the Global Warming Solutions Act of 2006, and its 2016 update, Senate Bill (SB) 32. Together, these laws require CARB to develop regulations that reduce GHG emissions to 1990 levels by 2020 and to 40 percent below 1990 levels by 2030. CARB developed and approved its first Scoping Plan, describing its approach to meeting the AB 32 goal, in 2008. With enactment of SB 32, CARB (2017) is undertaking a 2017 Climate Change Scoping Plan Update. In addition to the Scoping Plan, CARB maintains an online inventory of GHG emissions in California. The most recent inventory, released in June 2016, includes emissions from 2000 to 2014. This inventory is an important companion to the Scoping Plan because it documents the historical emission trends and progress toward meeting the 2020 and 2030 targets, which are 431 $MMTCO_2e$ and 260 $MMTCO_2e$, respectively.

In order to monitor the State's emission reduction progress, the Scoping Plan includes a modeled reference scenario, or "business as usual" (BAU) projection, which estimates future emissions based on current emissions, expected regulatory implementation, and other technological, social, economic, and behavioral patterns. Prior BAU emissions estimates assisted CARB in demonstrating progress toward meeting the 2020 goal of 431 MMTCO2e. The 2030 BAU reference scenario was modeled for the 2017 Scoping Plan Update, representing the forecasted state GHG emissions with existing policies and programs but without additional action beyond that to reduce GHGs. This modeling shows that the State is expected to achieve the 2020 target but that a significant

increase in the rate of GHG reductions will need to be realized in order to meet the 2030 and 2050 targets (CARB 2017).[34]

4.6.1.2 National

The primary source of GHG in the United States is energy-use related activities, which include fuel combustion and energy production, transmission, storage and distribution. Energy related activities generated 84 percent of the total U.S. emissions in 2012. Fossil fuel combustion represents the vast majority of the energy related GHG emissions, with CO_2 being the primary GHG. The United States, which has about 4.4 percent of the global population, emits roughly 12 percent of all global GHG emissions.

4.6.1.3 State

California, which has approximately 0.51 percent of the global population, emits less than 0.85 percent of the total global GHG emissions, which is approximately 40 percent lower per capita than the overall U.S. average. Despite growing population and gross domestic product (GDP), gross GHG emissions continue to decrease, as do emissions per capita (per capita emissions have dropped from 14 tons to 11.4 tons), exhibiting a major decline in the "carbon intensity" of the State's overall economy. The transportation sector remains responsible for the largest share of GHG emissions in the 2016 Inventory, accounting for approximately 36 percent of the total. While transportation and electric power sector emissions are decreasing year to year, other sectors have been flat or rising slightly (CARB 2016). Since its 2004 peak, the State has reduced its total annual emissions by 9.4 percent; transportation sector emissions are 13 percent lower.

Even though California is aggressively moving to reduce its annual GHG emissions, the effects of GHG-related climate change, which is a relevant aspect of the environmental setting, are already occurring. A 2013 report entitled *Indicators of Climate Change in California* (State Office of Environmental Health Hazard Assessment [OEHHA] 2013) concludes that the changes occurring in California are largely consistent with those observed globally. These climate change indicators show the following.

- Annual average temperatures in the State are on the rise, including increases in daily minimum and maximum temperatures.
- Extreme events, including wildfire and heat waves, are more frequent.

[34] CARB (2017) recommends that local governments aim to achieve a community-wide goal to achieve emissions of no more than 6 MTCO2e per capita by 2030 and no more than 2 MTCO2e per capita by 2050 (as part of Executive Order S-03-05 [Schwarzenegger 2005] and its GHG emission reduction target of 80 percent below 1990 levels by 2050, and consistent with Executive Order B-30-15 to reduce emissions to 40 percent below 1990 levels by 2030 [Brown 2015]). These goals are appropriate for the plan level (e.g., city, county, subregional, or regional), but not for specific individual projects because they include all emissions sectors in the State.

- Spring runoff volumes are declining as a result of a diminished snowpack.
- The number of "winter chill hours" – crucial for the production of high-value fruit and nut crops – are declining.
- Species are on the move, showing up at different times and locations than previously recorded, including both flora and fauna at higher elevations.

4.6.1.4 Local and Regional

As part of the City's obligation under AB 32 to reduce GHG emissions by 20 percent, the City's facilities energy savings goal is to reduce energy use by 20 percent from a 2005 baseline. The City's Energy Action Plan (EAP) identifies several ways the City could reduce energy consumption, including a variety of incentives and programs, as well as community based social marketing (City of Huntington Beach 2011). The EAP notes that future policy-making for the City will focus on the benefits of a cleaner environment, eliminating energy waste, and improving energy effectiveness. In order to track progress, the City will monitor energy usage and track energy reduction with the use of an Enterprise Energy Information Management System.

A regional air quality management plan that has changed since the 2010 FSEIR was certified is the South Coast Air Quality Management District (SCAQMD) Vision for Clean Air: A Framework for Air Quality and Climate Planning. In ~~2012~~2016, the SCAQMD ~~released a~~updated the regional planning framework that combines air pollution control strategies with climate goals; future emissions controls assumed that the future transportation fleet would become more reliant on electric power (SCAQMD ~~2012~~2016a). ~~The SCAQMD is developing an update to the Air Quality Management Plan for approval in 2017.~~ Desalination facilities, the region's water supply, and energy used for water supplies are not specifically mentioned in the current plan (SCAQMD ~~2012~~2016a).

4.6.2 Regulatory Setting

Appendix A summarizes relevant federal and state laws, regulations, and policies related to GHG emissions. Project GHG emissions at the POLB and offshore Los Angeles and Orange Counties are within the jurisdiction of the SCAQMD. The SCAQMD Governing Board adopted an interim GHG significance threshold of 10,000 $MTCO_2e$/year for projects where the SCAQMD is lead agency.

4.6.3 Significance Criteria

The criteria for determining the significance of impacts for this analysis are the same that were used in the 2010 FSEIR to evaluate GHG emission impacts, and are based on the State CEQA Guidelines Appendix G Checklist, specifically if the Lease Modification Project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions

Short-term construction-related GHG emissions and changes in operational emissions are therefore subject to the SCAQMD threshold of 10,000 MTCO2e for annually recurring emissions from stationary sources (SCAQMD 2015). The SWRCB (2015) also identifies the GHG Threshold of Significance for Operational Emissions Impacts in the South Coast to be 10,000 metric tons per year (MT/yr) CO2e for industrial facilities. To compare against this threshold, emissions from construction activities are amortized over the presumed project's life, although construction activities are normally dominated by mobile sources rather than stationary sources. For these reasons, 10,000 MTCO2e is used here as the threshold that determines whether project-related GHG emissions would have a significant impact on the environment.

4.6.4 Environmental Impact Analysis and Mitigation

2010 PROJECT

In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB Desalination Plant co-located and stand-alone operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted the following Findings for climate change (Item 62, October 29, 2010).

- The [2010 Project] will not result in significant impacts to climate change. Less than significant impact.

The CSLC subsequently added a lease condition requiring Poseidon to, at all times during the term of the Lease, comply at a minimum with an Energy Minimization and Greenhouse Gas Reduction Plan (GHG Plan), as adopted by the City of Huntington Beach or subsequently modified in any way. The following statement was included in the facts supporting this finding.

> *As discussed in Section 4.12 of the SEIR, the SCAQMD significance threshold of 10,000 MTCO2E/yr for industrial projects is being utilized to assess the significance of the proposed project's GHG emissions, even though SCAQMD is not the lead agency. This threshold includes both operational emissions (direct and indirect) plus construction emissions. The proposed project would result in direct GHG emissions of 2,187 to 2,191 metric tons of CO2 during project construction, and 4,128 metric tons of CO2 aggregated over the 30 year life of the project (424 MTCO2 per year) under both the co-located and stand-alone scenarios. Additionally, based on the information contained in Tables 4.12-4 through 4.12-6 in the SEIR, the proposed project would result in net indirect GHG emissions between 22,188 to 29,205 metric*

tons of CO2 per year for the co-located scenario, and 25,929 to 26,160 metric tons of CO2 per year under both the co-located and stand-alone scenarios. While these emissions are larger than the 10,000 MTCO2E/yr threshold, the proposed project has incorporated project design features included in its Energy Minimization and Greenhouse Gas Reduction Plan, which would offset the project's GHG emissions entirely, and as a result impacts would be less than significant.

The proposed project would incorporate project design features that require a one-time purchase of GHG offsets or RECs for the project's direct GHG emissions associated with Project construction and vehicle use during operation of the project. This would offset direct emissions of 6,315 to 6,319 metric tons of CO2 (2,187 to 2,224 metric tons for construction and 4,128 metric tons for vehicle operations over the project's 30-year life). Project design features would require the purchase of offsets or RECs to cover estimated net indirect GHG emissions over the life of the project (equivalent to 22,188 to 29,205 metric tons of CO2 per year), as well as an annual reporting process to ensure that the applicant maintains a zero net GHG emissions balance. With incorporation of these project design features, the project would have a net zero increase in GHG emissions. Therefore, the project would have emissions below SCAQMD's 10,000 MTCO2E/yr threshold, and project impacts would be less than significant. Further, because the project design features require the project to maintain a zero net GHG emission balance, the project would not cause an increase in GHG emissions above the existing baseline, and therefore would have no GHG emission impact on the environment.

The proposed project is also being evaluated based on whether it would conflict with any applicable plan, policy or regulation adopted for the purpose of reducing greenhouse gases.... Since the project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases, no significant impact would occur.

SWRCB FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT (SED)

In its *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes*, the SWRCB (2015a) reported that energy consumption associated with desalination ranges from 12,000-18,000 kilowatts-hours per million gallons (kWh/mgal), which makes it the most energy intensive alternative compared to other water supply options. (Pacific Institute 2013) The RO process consumes about 67 percent of the total energy used for a desalination plant, about 13 percent is used for post treatment and pumping, another 13 percent is used for pretreatment, and about 7 percent is used for pumping seawater to the plant. This estimates that on average about 1,050 kWh/mgal is used for withdrawing seawater to a facility. With respect to the HB Desalination Plant, the SWRCB (2015a) noted that operation of the HB Desalination Plant was estimated to generate approximately 80,000

metric tons of CO2e annually (based on an annual electricity use of 750,000 kilowatt-hours), and that these estimates exceed the SCAQMD threshold for industrial sources of 10,000 MTCO2e; however, because the proponent of the facility indicated that operations will be carbon neutral, an outcome that would be achieved through the purchase of offsets and reductions achieved by reduced use of other water supplies, the facility was described as having less than significant impact on GHG emissions.

ENVIRONMENTAL IMPACT ANALYSIS – LEASE MODIFICATION PROJECT

Proposed Lease Modification Project elements consist of offshore construction activities required to install wedgewire screens and a multiport diffuser on the HBGS pipelines, reduction in seawater intake volume (to 127 MGD for co-located and 106.7 MGD for stand-alone) through the new screens, and operation and maintenance of the screens and diffuser. For climate change and GHG emissions, there would be no different effects from the three potential operational scenarios (co-located and stand-alone operations), so they are not addressed separately in this analysis. Table 4.6-3~~2~~ at the end of this section summarizes potential impacts and proposed mitigation measures.

Impact GHG-1: GHG Emissions from Project Activities.

Construction activities associated with the Lease Modification Project would increase GHG emissions (**Less than Significant**).

Impact Discussion

Installation of the screens and diffuser would cause an increase in GHG from marine vessels and construction equipment used for demolition, dredging, and physically installing the systems. The one-time Lease Modification Project construction emissions would total 71.64 MTCO2e (Dudek 2017), and these may be amortized over a presumed 50-year project life for the HB Desalination Plant to arrive at an annual GHG emissions impact of 1.43 MTCO2E~~e~~ for construction of the intake and discharge modifications. These emissions would combine with HB Desalination Plant construction emissions, which on their own would result in approximately 822 MTCO2e from on-site construction plus 1,233 MTCO2e from off-site construction activities (Poseidon 2017c). Construction-related GHG emissions would not represent a long-term source of GHG emissions, and the quantities would be small in relation to the 10,000 MTCO2e threshold.

Over the longer-term period of operation of the intake and discharge structures, maintenance to manually clean the offshore wedgewire intake screens would involve a small number of worker vehicle trips and use of a crew boat during one or two days every two months (Dudek 2017). The additional worker trips for periodic maintenance and use of the crew boat to transport divers to the wedgewire intake screens for manual cleaning/inspection would result in emissions that would recur at a rate of 6.62 MTCO2e

per year. A lower level of maintenance activity is presumed to be necessary for the rotating wedgewire screen options; however, if the rotating screen option is implemented, the motors would consume electricity at a rate of approximately 52 MWh/year, resulting in 14.12 MTCO2e per year of additional indirect emissions for the power supply (Dudek 2017). These operation and maintenance GHG emissions would be small in relation to the 10,000 MTCO2e threshold.

With the new Lease Modification Project components, the wedgewire screens would also increase by 1 percent to 3 percent the energy consumption for drawing seawater into the HB Desalination Plant. The 2010 FSEIR took a conservative approach to the electricity and energy consumption associated with the reverse osmosis and product water pumps and reserve osmosis (RO) membranes; since the time of that study, Poseidon expects to be able to procure much more energy efficient pumps and membranes (Poseidon 2017b).The overall annual power use by the HB Desalination Plant with the new Lease Modification Project components would be approximately the same as analyzed in the 2010 FSEIR and the most-recent (February 27, 2017) version of the Poseidon GHG Plan (see Appendix E), as 265,888 MWh/yr (Poseidon 2017c). The emissions associated with providing electricity to operate the overall HB Desalination Plant would not change.

Table 4.6-2~~1~~ summarizes and totals quantities of GHG emitted during construction of the offshore intake and diffuser system, and incremental additional emissions for operation and maintenance of the wedgewire intake screens and the rotating screen option.

Table 4.6-2~~1~~. Intake and Discharge, Project-Specific GHG Emissions

Lease Modification Project	One-Time Construction Activity (MTCO2e)	Presumed Project Life	Project-Specific GHG Emissions (MTCO2e per year)
Construction of Intake and Discharge Modifications	71.64	50 years	1.43
O&M of Intake and Discharge Modifications	—	—	6.62
Rotating Wedgewire Screen Option (Electricity Use)	—	—	14.12
Significance Threshold	—	—	10,000

Note: "—" means no applicable threshold.
Source: Dudek 2017.

The 2010 FSEIR analysis of the overall HB Desalination Plant included the incorporation of design features described within the Energy Minimization and Greenhouse Gas Reduction Plan (the GHG Plan) to bring to zero the net indirect GHG emissions associated with the Project. ~~As in the 2010 FSEIR analysis, a~~All emissions, both from the 2010 Project and the Lease Modification Project, ~~will~~ would be covered within the

GHG Plan, which was updated in February 27, 2017 (see Appendix G). Specifically, Poseidon commits, pursuant to the following Applicant Proposed Measure (APM), to offset all direct and indirect construction and post-construction (operational) GHG emissions.

> **APM-7.** An *Energy Minimization and Greenhouse Gas Reduction Plan,* most recently updated February 27, 2017, shall be implemented to offset the total direct and indirect GHG emissions from construction and operations of the HB Desalination Plant.

Upon implementation of APM-7, the GHG Plan would provide sufficient GHG offsets or RECs to "bring to zero the total amount of direct and indirect GHG emissions" from the overall HB Desalination Plant including the new modifications. ~~With this design feature in place,~~

The one-time Lease Modification Project construction GHG emissions, amortized at 1.43 MTCO2e per year, would be small in relation to the 10,000 MTCO2e threshold, and would constitute a negligible increase in GHG emissions from the approved 2010 FSEIR. The maximum amount of GHG emissions that could occur during Lease Modification Project operations would be 6.62 MTCO2e of direct emissions and 14.12 MTCO2e of indirect emissions. As with construction emissions, operational emissions would not exceed the threshold of significance and would cause a very minor increase in GHG emissions from those approved in the 2010 FSEIR. The Lease Modification Project construction and operational activities, analyzed independently from APM-7, would not have a significant impact on the environment and would not substantially contribute to global GHG emissions. Therefore, the impact of project-related GHG emissions would be less than significant.

Mitigation Measures

With implementation of the APM-7, the impact related to GHG emissions would be reduced. Independent of APM-7, no significant impacts from Lease Modification Project activities are identified for this impact, ~~N~~no mitigation measures are ~~recommended~~ required, and no previously adopted mitigation measures apply to GHG emissions.

Impact GHG-2: Consistency with Applicable GHG Plan, Policy, or Regulation.

Construction activities and operational fossil fuel and electricity use would cause GHG emissions that would not conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHG **(Less than Significant).**

Impact Discussion

Installation of the wedgewire screens and the diffusers would not change the overall ability of the desalination facility to comply with GHG-related plans, policies, or regulations. ~~As identified in t~~The 2010 FSEIR identified a GHG Plan developed by

Poseidon with design features to offset~~,~~ the direct and indirect GHG emissions~~, including those added by the new modifications, would be offset through the design features set forth in a GHG Plan developed by Poseidon to be implemented through APM-7~~. The most recent update of the GHG Plan was provided on February 27, 2017, incorporating Lease Modification Project activities, and is presented as APM-7. As with the 2010 FSEIR, the proposed Lease Modification Project would not conflict with any applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions.

Mitigation Measures

No mitigation measures are recommended.

4.6.5 Cumulative Impacts

The 2010 FSEIR concluded that since the project design features and mitigation measures identified for the desalination facility would entirely offset the project's contribution to the cumulative effects of GHG emissions, the project's effects relative to climate change and GHG emissions are not cumulatively considerable. The analysis for this Supplemental EIR has been updated to consider current projects and the location of the Lease Modification Project.

Changes in the global climate attributable to anthropogenic GHG emissions are cumulative effects of past, present, and future actions worldwide. While worldwide contributions of GHG emissions are expected to have environmental consequences, GHGs emitted from a particular source or location cannot be linked to particular changes to the environment of California. Table 3-1 and Figure 3-1 in Section 3.0, *Cumulative Projects*, present a list of cumulative projects applicable to this cumulative impact analysis. The largest and closest projects to the Lease Modification Project are the HB Energy Project, the Magnolia Oil Storage Tank Farm Demolition, and the Ascon Landfill Remediation Project. These onshore projects have already or could substantially contribute to statewide GHG emissions. In addition, Figure 3-2 illustrates other desalination projects that are currently operating or proposed in California, illustrating the potential for additional projects to emit GHGs. The four other Southern California desalination projects (in addition to the HB Desalination Plant) illustrated in Figure 3-2 as "New and Expanded Seawater Desalination Facilities," are spread along about 80 miles of coastline between Carlsbad and Los Angeles.

The GHG emissions attributable to the proposed modifications would be offset through the design features and APM-7, which implements the "GHG Plan." However, independent of APM-7, the Lease Modification Project construction GHG emissions would be amortized at 1.43 MTCO2e per year, would be short-term, would cease upon completion, and would not exceed the threshold of significance. The operational GHG emissions will result in no more than approximately 21 metric tons of CO2e annually,

with 14 metric tons identified as indirect emissions if rotating brush-cleaned screens are used. Therefore, GHGs from Lease Modification Project component construction or operation would not substantially contribute to statewide or global GHG emissions, ~~As stated in the 2010 FSEIR, this approach ensures that the Lease Modification Project would entirely offset the Project's contribution to the cumulative effects of GHG emissions,~~ and the Lease Modification Project's effects on the environment from~~relative to~~ GHG emissions ~~are~~ would not be cumulatively considerable.

4.6.6 Mitigation Measure/Applicant Proposed Measure Summary

Table 4.6-3~~2~~ summarizes any mitigation measures or APMs identified in this Supplemental EIR, or those adopted for the 2010 Project if also applicable, to reduce or avoid potential significant impacts associated with the Lease Modification Project.

Table 4.6-3~~2~~. Impact and MM/APM Summary

Impact	MM/APM
2010 Project	
Mitigation measures for air quality impacts that may also apply to GHG reduction (see Table 4-3-3) required in the 2010 FSEIR addressed onshore construction and operation activities. **CON-10** (Dust Suppression) **CON-11** (Hauling Activities) **CON-12** (Construction Equipment Maintenance) **CON-13** (Architectural Coating ROG Emission Reduction) **CON-14** (Diesel Fuel Reduction Plan)	
Lease Modification Project	
GHG-1: GHG Emissions from Project Activities	**APM-7.** Energy Minimization and Greenhouse Gas Reduction Plan
GHG-2: ~~Conflict~~ Consistency with an applicable GHG plan, policy or regulation ~~adopted for the purpose of reducing GHG emissions~~	None recommended

4.7 HAZARDS AND HAZARDOUS MATERIALS

In 2010, the city of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), analyzed hazards and hazardous materials associated with construction and operation of the Huntington Beach Desalination Plant (HB Desalination Plant or 2010 Project) in Sections 4.8 (Hazards and Hazardous Materials) and 4.9 (Construction-Related Impacts) of its certified Final Subsequent Environmental Impact Report (2010 FSEIR). In 2016, Poseidon Resources (Surfside) LLC (Poseidon) submitted an application to the California State Lands Commission (CSLC) to amend Lease PRC 1980.1 to install, operate, and maintain wedgewire screens and a multiport diffuser on the offshore ends of the existing AES Huntington Beach Generating Station (HBGS) seawater intake and discharge pipelines (hereinafter referred to as the Lease Modification Project). This Supplemental EIR analyzes hazards and hazardous materials associated with the proposed Lease Modification Project activities for the following reasons.

- The 2010 Project did not include the offshore construction activities that are contemplated in Poseidon's 2016 application.
- The 2010 FSEIR did not address potential impacts of hazards and hazardous materials associated with construction in the Pacific Ocean offshore the City and Huntington State Beach.

Section 4.7 describes potential hazardous conditions, evaluates the type and significance of potential impacts based on anticipated changes to existing conditions, and recommends measures if necessary to avoid or reduce significant impacts. The impact area evaluated includes areas near the seaward end of PRC 1980.1 where subsurface anchoring, dredging, riprap reconfiguration, and pile-driving activities are proposed.

4.7.1 Environmental Setting

Hazardous substances are defined by federal and state regulations as substances that must be regulated to protect the public health and the environment. California Health and Safety Code section 25501 provides the following definition:

> *"Hazardous material" means a material ... that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment....*

Hazardous wastes are hazardous substances that either no longer have a practical use, such as material that has been abandoned, discarded, spilled, or contaminated, or which are being stored prior to disposal. Toxic substances may cause short-term or long-term health effects ranging from temporary effects to permanent disability or death.

Toxic substances include most heavy metals, gasoline, natural gas, explosives, pressurized canisters, and radioactive and biohazardous materials. Soils may also be toxic because of accidentally spilled toxic substances.

The wedgewire screens and diffuser would be installed in state waters, approximately 1,650 feet and 1,500 feet offshore, respectively. The proposed modifications would occur at the ends of the existing HBGS subsurface intake and outfall pipelines. The onshore desalination plant site is located near the Ascon Landfill, which contains hazardous materials; however, groundwater sampling near the site showed no contamination from the landfill (City of Huntington Beach 2010). Laboratory soil testing conducted during geophysical surveys in the site vicinity similarly showed no contaminated soils or hazardous materials (Ecosystems Management Associates, Inc. [ECO-M] 2015). No pollutants or substances that would be classified as hazardous materials are known to have contaminated the area where offshore where construction would occur.

4.7.2 Regulatory Setting

Appendix A summarizes relevant federal and state regulations. No local regulations relevant to hazards and hazardous materials apply to the offshore area where the Lease Modification Project would be installed. Three relevant local programs govern hazardous materials: the Orange County Emergency Plan, the Orange County Certified Unified Program Agency, and the Huntington Beach General Plan (Policies HM 1.1.3, HM 1.2.2, and HM 1.6.1). These are described in more detail in the 2010 FSEIR.

4.7.3 Significance Criteria

The criteria for determining the significance of impacts for this analysis are the same that were used in the 2010 FSEIR to evaluate hazards and hazardous materials impacts, and are based on the State CEQA Guidelines Appendix G Checklist. The Lease Modification Project may create a significant impact related to hazards or hazardous materials if one or more of the following applies:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

The remaining criteria from the 2010 FSEIR for hazards and hazardous wastes do not apply because the offshore Lease Modification Project area is not located within: (1) 0.25 mile of an existing or proposed school; (2) on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Cortese List); (3) within an airport land use plan or 2 miles of a public airport or public use airport or vicinity of a private airstrip; or (4) in an area that would be exposed to

wildland fires. Offshore construction, operation, and maintenance would also not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

4.7.4 Environmental Impact Analysis and Mitigation

2010 PROJECT

The 2010 FSEIR (City 2010) included the following conclusions related to hazards and hazardous materials.

- All construction impacts of building the HB Desalination Plant associated with hazards and hazardous materials would be less than significant.
- The 2010 Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- The 2010 Project would not create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Cumulative impacts related to hazards and hazardous materials are not anticipated to be significant.

In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB Desalination Plant co-located and stand-alone operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted the following Findings associated with hazards and hazardous materials (Item 62, October 29, 2010).

- The [2010 Project] may have adverse short-term construction related impacts in regards to hazards and hazardous materials. However, changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the potential significant environmental effects identified in the SEIR, including standard conditions, project design features and incorporation of mitigation measures CON-19 through CON-33, inclusive. Less than significant impact with mitigation.
- The [2010 Project] will not result in significant long-term operational impacts relating to hazards or hazardous materials with respect to existing on-site and off-site contamination, project operations, RO membrane cleaning solution or product water treatment materials. Less than significant impact.

The City and CSLC also adopted a Mitigation Monitoring Program (MMP) as part of their respective discretionary actions. Mitigation Measures (MMs) CON-19 through

CON-33 related to hazards and hazardous materials apply to onshore construction activities:

SWRCB FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT (SED)

In its *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes*, the SWRCB (2015a) noted that seawater desalination facilities that rely on RO require chemical additions for pre and post treatment and membrane maintenance. All chemicals must be transported and stored on site in bulk. Pretreatment may include the addition of acids, coagulants and flocculants. Post treatment requires disinfection by chlorination or less reactive sodium hypochlorite, pH control through addition of CO_2 and conditioning using sodium or calcium hydroxide to protect the water distribution system. Dechlorination is accomplished through addition of sodium bisulfite. Membranes are typically taken off line periodically and cleaned using dilute hydrochloric or critic acid. In addition, biocides such as chlorine may be used to clean intake and discharge pipes.

ENVIRONMENTAL IMPACT ANALYSIS – LEASE MODIFICATION PROJECT

Proposed Lease Modification Project elements consist of offshore construction activities required to install wedgewire screens and a multiport diffuser on the HBGS pipelines, reduction in seawater intake volume (to 127 MGD for co-located and 106.7 MGD for stand-alone) through the new screens, and operation and maintenance of the screens and diffuser. Table 4.7-1 at the end of this section summarizes potential impacts and proposed mitigation measures.

Impact HAZ-1: Construction and Operation Impacts of Routine Hazardous Material Transport, Use, or Disposal.

Project construction and operation would use and transport hazardous substances in quantities too small to present a significant hazard to the public or the environment. **(Less than Significant)**

Impact Discussion

Construction of the Lease Modification Project would involve the use and transport of commonly used hazardous substances, such as gasoline, diesel fuel, lubricating oil, grease, and solvents. Construction-related activities would be limited to a 3-month construction period. Chemicals and hazardous materials used during construction of the proposed Lease Modification Project would be used in quantities below the levels deemed to be significant hazards to the public or the environment, as defined by the applicable federal, state, and local hazardous materials handling and management regulations. Project-related construction does not generate or require disposal of hazardous materials, and would not create new hazards to the public or the

environment. Construction-related impacts due to routine transport, use, or disposal of hazardous materials would therefore be less than significant.

Project operation would not substantially change the potential environmental effects of the HB Desalination Plant from hazards and hazardous materials previously analyzed in the 2010 FSEIR. In a worst-case scenario, maintenance activities could involve the use of common hazardous substances used for marine vessel operations such as gasoline, oil, and other chemicals. Maintenance-related activities requiring a marine vessel would be limited to a maximum of 17 times a year (CSLC 2017). Chemicals and hazardous materials used during operation and maintenance of the Project would be used in quantities below quantities deemed to be significant hazards to the public or the environment, as defined by the applicable federal, state, and local hazardous materials handling and management regulations. Project-related operation and maintenance activities do not include the generation or disposal of hazardous materials, and would not create new hazards to the public or the environment. Therefore, the operation- and maintenance-related impacts from the routine transport, use, or disposal of hazardous materials would be less than significant.

Mitigation Measures

No mitigation measures are recommended.

Impact HAZ-2: Release of Hazardous Materials through Reasonably Foreseeable Upset and Accident Conditions.

Project construction and operation would use and transport hazardous substances with the potential for accidental release into the environment **(Less than Significant with Mitigation).**

Impact Discussion

The support barge and other support vessels may accidentally discharge oils, fuel, lubricants, or other contaminants into the ocean. Other potential sources of marine spillage would include deck equipment such as compressors, generators, pumps, and welding machines. Poseidon would be required to transport, handle, and dispose of hazardous materials or chemicals in accordance with all federal, State, and local laws regulating the management and use of hazardous materials. However, accidental spillage can still happen, and accidents can pose a risk to the public and the environment. A spill from a construction vessel could occur during refueling, if the hull of a vessel is breached in the area of the tank or if a vessel sinks. However, the collision of a Project-related vessel with other vessels in the area is unlikely since all work would be done during daylight hours.

Poseidon has committed to the preparation and implementation of APM-3, Spill Prevention and Response Plan for vessels used during construction of the Project.

APM-3. Spill Prevention and Response Plan. At least 60 days before commencement of offshore construction, a Spill Prevention and Response Plan for all vessels to be used for project activities shall be prepared by Poseidon and submitted for review and approval by California State Lands Commission (CSLC) staff that includes at a minimum the following elements:

- A list of all fuels and hazardous materials that will be used or might be used during offshore construction, along with Material Safety Data Sheets for each material
- Specific protocols for monitoring and minimizing the use of fuel and hazardous materials during offshore construction project operations, including best management practices that will be implemented to ensure minimal impacts to the environment
- An estimate of a reasonable worst case release of fuel or other hazardous materials at the offshore construction project site or into coastal waters resulting from the offshore construction activities
- A list of all spill prevention and response equipment that will be maintained on the vessels performing the offshore construction activities
- The designation of the on-site person with responsibility for implementing the plan
- A detailed response and clean-up plan in the event of a spill or accidental discharge or release of fuel or hazardous materials
- A telephone contact list of all regulatory and trustee agencies, including CSLC and California Coastal Commission staffs, having authority over the development and/or the project site and its resources to be notified in the event of a spill or material release.

Implementation of this APM would ensure that impacts related to the accidental release of hazardous materials during construction would be minimized through protocols for minimizing and monitoring the use of fuel and hazardous materials, retention of spill prevention and response equipment, and a detailed response and clean-up plan. However, these impacts would still be significant in the event of poor weather conditions that would increase the risk of offshore spills. To minimize that potential risk to workers or the environment during stormy weather, **MM HAZ-1** (Prepare for Inclement Weather Condition) is recommended. This measure requires that construction be stopped if existing or forecasted sea conditions or weather would create unsafe working conditions for personnel or equipment.

A potential tsunami is commonly identified in advance of the actual event onshore and, where possible, early notification to coastal areas is provided. **MM HAZ-1** would further minimize the potential for hazardous materials to affect workers or the environment from a tsunami. Through this mitigation measure, the likelihood of accidental discharges from marine vessels would be reduced because the crew would be trained and prepared to

prevent hazardous materials from spilling into the ocean. With implementation of **MM HAZ-1** and a Hazardous Material Spill Prevention and Response Plan, the potential for spilling hazardous materials would be reduced, resulting in a less-than-significant impact.

Divers would be required to build the screens and diffuser. Divers could be exposed to hazardous substances or vapors if they are spilled near the surface-supplied air intake (CSLC 2012). In order to protect divers from these potentially hazardous vapors, Poseidon would comply with U.S. Coast Guard and Occupational Safety and Health Association regulations related to commercial diving (29 CFR 1910 and 1926). There would therefore be no impact to diver safety.

The increase in use, storage or transport of any hazardous materials or chemicals associated with just the Lease Modification Project would be minimal. Poseidon would also be required to transport, handle, and dispose of hazardous materials or chemicals in accordance with all federal, state, and local laws regulating the management and use of hazardous materials. Operational impacts associated with hazards and hazardous materials would be less than significant.

Mitigation Measures

The following mitigation measure is recommended to reduce potentially significant impacts that may result from offshore construction activities.

MM HAZ-1. Prepare for Inclement Weather Condition. Poseidon shall tie-down or provide secondary containment for any deck equipment that may discharge contaminants to minimize the potential for unanticipated release of pollutants due to inclement weather or rough sea conditions. In addition, Poseidon shall monitor weather conditions and tsunami warnings, and cease work if determined that existing or forecast sea states or weather conditions would create unsafe working conditions for personnel or equipment.

4.7.5 Cumulative Impacts

The 2010 FSEIR concluded that there would not be a significant cumulative impact related to hazards and hazardous materials all hazardous materials would be used, stored, and transported according to all Occupational Safety and Health Administration (OSHA) and U.S. Environmental Protection Agency (USEPA) regulations. The analysis for this Supplemental EIR has been updated to consider current projects and the location of the Lease Modification Project.

Cumulative impacts related to hazards and hazardous materials would result from projects that collectively increase exposure to hazards and hazardous materials. The geographic extent of the cumulative impact analysis considered projects adjacent to the proposed HB Desalination Plant, the proposed modifications, and projects along Huntington Beach. Of the cumulative projects listed in Section 3, *Cumulative Projects*,

the Huntington Beach Energy Project (HB Energy Project), the Ascon Landfill Remediation, the Magnolia Oil Storage Tank and Transfer Facility Demolition and Removal Project, and the Magnolia Tank Farm Redevelopment Project could contribute to cumulative impacts from hazards and hazardous materials.

The Lease Modification Project and cumulative projects would comply with applicable federal, state, and local laws regulating the management and use of hazardous materials. Additionally, implementation of the Applicant Proposed Measures identified in Section 2.5, *Applicant Proposed Measures*, would reduce potential Project-related hazards during construction. The impacts from the Project and the cumulative impacts from the Ascon Project and HB Energy Project could occur at the same time, as their construction schedules are expected to overlap. Construction of the HB Energy Project, Ascon, and Magnolia projects would result in the release of hazardous materials to the environment. Further, construction of the Lease Modification Project, in combination with the other cumulative projects, would involve the use and transport of commonly used hazardous substances such as gasoline, diesel fuel, lubricating oil, grease, and solvents. The accidental spill or use of hazardous materials could be potentially hazardous to the public or the environment. Given the close proximity of the HB Energy Project, Ascon, and Magnolia projects to the Pacific Ocean, hazardous materials spills could reach the ocean through surface water runoff, groundwater migration, or sediment transport.

The Lease Modification Project has a short-term construction period plus periodic maintenance activities. Quantities of chemicals and hazardous materials for Project activities would be below the levels constituting a potential for a significant hazard to the public or the environment. If Poseidon implements **MM HAZ-1**, potential impacts due to accidental spills would be further reduced. While a simultaneous, accidental release of hazardous materials from the Lease Modification Project and cumulative projects may pose a cumulatively significant impact to the environment, the Project's contribution would not be cumulatively considerable given the small scale of hazardous materials used. Further, the likelihood of such an event is low and each project would have a hazardous spill response plan in place to limit potential combination with adjacent projects. Therefore, construction and operation of the proposed modifications, in combination with the other cumulative projects, would not result in a cumulatively considerable impact from hazards and hazardous materials.

4.7.6 Mitigation Measure/Applicant Proposed Measure Summary

Table 4.7-1 presents the mitigation measures from the project approved in 2010 and indicates whether each mitigation measure is also applicable to the Lease Modification Project. It also presents any new mitigation measures developed for this Supplemental EIR, which would only be applicable to the Lease Modification Project.

Table 4.7-1. Impact and MM/APM Summary

Impact	MM/APM
2010 Project	
No significant impacts associated with ~~noise~~ hazards and hazardous materials were identified in the 2010 FSEIR. Mitigation measures required in the 2010 FSEIR addressed construction activities. • **CON-19 (**Pre-Excavation Activities). • **CON-20** (Excavation Procedures Compliance) • **CON-21** (Remedial Action Plan and Health and Safety Plan) • **CON-22** (Asbestos and Lead Remediation) • **CON-23** (Identification or Release of Previously Unaddressed Hazardous Materials During Site Cleanup) • **CON-24** (Cleansing of Hazardous Materials from Structures Prior to Off-Site Transportation or Hauling Off-Site as Waste) • **CON-25** (Structure Removal Operations Compliance with SCAQMD Regulations and Standards) • **CON-26** (Sign Postage Prior to Remediation) • **CON-27** (Uncovering of Unrecorded or Unknown Wells During Excavation or Grading) • **CON-28** (Soil Found to Be Hazardous Due to Contamination Other Than from Petroleum Hydrocarbons) • **CON-29** (Dust and Volatile Organic Emissions) • **CON-30** (Pipeline Construction Impact on Drainage of Former Cannery Street Landfill) • **CON-31** (Methane Migration Features) • **CON-32** (Landfill Gas Generation and Migration Studies) • **CON-33** (Completion of Required Remediation Activities for Contaminated Soils)	
Lease Modification Project	
HAZ-1: Construction and Operation Impacts of Routine Hazardous Material Transport, Use, or Disposal	None recommended
HAZ-2: Release of Hazardous Materials through Reasonably Foreseeable Upset and Accident Conditions	• **APM-3**: see above • **MM HAZ-1:** Prepare for Inclement Weather Condition

4.8 NOISE AND VIBRATION

In 2010, the city of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), analyzed noise and vibration impacts associated with construction and operation of the Huntington Beach Desalination Plant (HB Desalination Plant or 2010 Project) in Sections 4.5 (Noise) and 4.9 (Construction-Related Impacts) of its certified Final Subsequent Environmental Impact Report (2010 FSEIR). In 2016, Poseidon Resources (Surfside) LLC (Poseidon) submitted an application to the California State Lands Commission (CSLC) to amend Lease PRC 1980.1 to install, operate, and maintain wedgewire screens and a multiport diffuser on the offshore ends of the existing AES Huntington Beach Generating Station (HBGS) seawater intake and discharge pipelines (hereinafter referred to as the Lease Modification Project). This Supplemental EIR analyzes impacts of noise and vibration associated with Lease Modification Project activities for the following reasons.

- The 2010 Project did not include the offshore construction activities that are contemplated in Poseidon's 2016 application.
- The 2010 FSEIR did not address potential impacts of noise and vibration associated with construction in the Pacific Ocean offshore the City and Huntington State Beach.

Section 4.8 evaluates the type and significance of potential noise and vibration impacts based on anticipated changes to existing conditions, and recommends measures if necessary to avoid or reduce significant impacts. The impact area evaluated includes areas near the seaward end of PRC 1980.1 where subsurface anchoring, dredging, riprap reconfiguration, and pile-driving activities are proposed. Noise impacts to wildlife associated with the Lease Modification Project are discussed in Section 4.1, *Ocean Water Quality and Marine Biological Resources*.

4.8.1 Environmental Setting

4.8.1.1 Fundamentals of Noise

Noise is defined as unwanted sound that is heard by people or wildlife and that interferes with normal activities or otherwise diminishes the quality of the environment. Noise should not be equated with all sounds, as nature makes many sounds that most people consider to be agreeable. Surf, for example, can be quite loud (i.e., have a high decibel [dB] reading), but would not be considered "noise." However, surf sounds can drown out noise generated from human sources that might be considered disagreeable.

Sound is measured on a logarithmic dB scale of pressure relative to a reference intensity of 20 micropascals (µPa) for measurements in air. The 20 µPa is near the threshold of normal human hearing. Because it is a logarithmic scale, an increase of 10 dB represents a 10 times increase in sound energy. Noise impacts on humans are

usually measured with the frequency spectrum adjusted by the A-weighting network for human exposure. The A-weighting network is a filter that approximates the response of the human ear at moderate sound levels. The resulting unit of measure is the A-weighted decibel (dBA).

To analyze the overall noisiness of an area, noise events are combined for an instantaneous value or averaged over a specific time period (e.g., 1 hour, multiple hours, 24 hours). The time-weighted measure is referred to as equivalent sound level (Leq) using the A-weighting, which is defined as the same amount of sound energy averaged over a given time period. The percentage of time that a given sound level is exceeded can also be represented. For example, L_{10} is a sound level that is exceeded 10 percent of the time over a specified period.

4.8.1.2 Noise Effects on Humans

Human response to noise is dependent not only on the magnitude but also on the characteristic of the sound, including the sound frequency distribution. Generally, the human ear is more susceptible to higher frequency sounds than lower frequency sounds. Human response to noise is also dependent on the time of day and expectations based on location and other factors. For example, a person sleeping at home might react differently to the sound of a car horn than to the same sound while driving during the day. The regulatory process has attempted to account for these factors by developing noise metrics such as Community Noise Equivalent Level (CNEL) and the Day-Night Average Noise Level (L_{dn}) which incorporate penalties for noise events occurring at night (all using the A-weighting). The L_{dn} rating is an average of noise over a 24-hour period in which noises occurring between 10 p.m. and 7 a.m. are increased by 10 dBA. The CNEL is similar but also adds a weighting of 5 dBA to noise events that occur between 7 p.m. and 10 p.m. Table 4.8-1 is a scale showing typical noise levels encountered in common daily activities.

The effects of noise are considered by how a project may increase existing noise levels and affect surrounding land uses and sensitive receptors and how a proposed land use may be affected by existing surrounding land uses. Sensitive receptors include residences, transient lodging, such as hotels and motels, hospitals, nursing homes, convalescent hospitals, schools, libraries, houses of worship, and public assembly places. When a new noise source is introduced, most people begin to notice a change in noise levels at approximately 5 dBA. Typically, average changes in noise levels of less than 5 dBA cannot be definitely considered as producing an adverse impact. For changes in average noise levels that exceed 5 dBA, most people would recognize the greater noise levels, although the impact may or may not be considered adverse.

Table 4.8-1. Representative Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Power Saw	—110—	Rock Band
Jet Fly-over at 100 feet		Crying Baby
Subway	—100—	
Gas Lawnmower at 3 feet		
Rail Transit Horn/ Tractor	—90—	
Jack Hammer		Food Blender at 3 feet
Rail Transit At-grade (50 mph)	—80—	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime		
Gas Lawnmower at 100 feet	—70—	Vacuum Cleaner at 10 feet
Rail Transit in Station/ Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	—60—	Sewing Machine
Air Conditioner		Large Business Office
Quiet Urban Area during Daytime	—50—	Dishwasher in Next Room
		Refrigerator
Quiet Urban Area during Nighttime	—40—	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	—30—	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	—20—	
		Broadcast/Recording Studio
	—10—	
Lowest Threshold of Human Hearing	—0—	Lowest Threshold of Human Hearing

Source: California Department of Transportation (Caltrans) 1998.

In community noise impact analysis, long-term noise increases of 5 to 10 dBA are considered to have “some impact.” Noise level increases of more than 10 dBA are generally considered severe. In the case of short-term noise increases, such as those from construction activities, the 10 dBA threshold between “some” and “severe” is replaced with a criterion of 15 dBA. These noise-averaged thresholds shall be lowered when the noise level fluctuates, when the noise has an irritating character such as considerable high frequency energy, or if the noise is accompanied by subsonic vibration. In these cases the impact must be individually estimated.

4.8.1.3 In-Water Hydroacoustics

Sound pressure levels in water are also described in dB, but with a ~~difference~~ reference pressure of~~:~~ 1 µPa, which is different from the reference pressure ~~instead~~ of 20 µPa as measured in air. The dB scale for hydroacoustics is also not corrected for A weighting and is presented without weighting, generally as a root-mean-square (RMS). The speed of sound underwater is also approximately 4 to 5 times faster than when it travels through air, depending on temperature and salinity. In addition, because the characteristic impedance of water is much greater than that of air, a sound source located above the water surface (in the air) has less effect under the water. The

difference in the characteristic impedance values of air and water causes a sound transmission loss between air and water of approximately 30 dB.

For construction activities in water, sound propagates through direct transmission from the source to the receiver, through reflected paths from the surface and the bottom of the water medium, and sound energy has the potential to be re-radiated from the ground due to vibrations within the ground below the water depending on the construction activity. Normally, the ground-radiated noise is dominated by low frequencies, which cannot propagate efficiently through shallow water.

Caltrans studies of construction activities indicate that underwater noise levels for various construction activities range from a high 220 dB (for piling driving or explosives) to a quiet waterbody with boat traffic (60 to 120 dB). Noise levels differ depending on the type of pile driver used as described in the Caltrans study.

Impact hammer	• Range: 180 to 220 dB peak sound level • Average sound level: 186 to 205 dB • Data for similar arrangement as Project (10- to 15-inch steel H piles): peak sound levels of up to 190 dB with average sound levels of 180 dB (for Noyo River, San Rafael Canal and Ballena Isle Marina in generally shallow water
Vibratory hammer	• Range: 165 to 195 peak sound level • Average sound level: 150 to 180 dB150 to 180 dB • Data for similar arrangement as Project (10- to 15-inch steel H piles): peak sound levels of up to 164 dB and an average sound level of 147 dB (Norfolk Naval Station, Northern Rail Extension and San Rafael Canal

Vibratory hammers generally produce less sound than impact hammers and are often employed as a mitigation measure to reduce the potential for adverse effects on fish that can result from impact pile driving. Although peak sound levels can be substantially lower for vibratory hammers than those produced by impact hammers, the total energy imparted can be comparable to impact driving because the vibratory hammer operates continuously (Caltrans 2015). For pile driving sounds that are predominately high frequency (e.g., small-diameter steel pipe or steel H-type piles), the transmission loss can be higher than losses associated with piles that predominantly produce lower frequencies (e.g., larger diameter piles).

4.8.1.4 Vibration Background

Vibrations caused by various activities can cause impacts as energy transmitted in waves through a solid mass, such as soil. These energy waves dissipate with distance from the vibration source. Since energy is lost during the transfer of energy from one particle to another, vibration that is distant from a source is usually less perceptible than vibration closer to the source. Human, animal and structural response to different vibration levels is influenced by a combination of factors, including soil type, distance between source and receptor, duration, and the number of perceived events.

Vibration consists of waves transmitted through solid material. Unlike in air, types of wave motion in solids include compressional, shear, torsional, and bending. The solid medium can be excited by forces, moments or pressure fields. This leads to the terminology "airborne" (pressure fields) or “structureborne/groundborne” (forces and moments) vibration.

Groundborne vibration propagates from the source through the ground to adjacent buildings by surface waves. Vibration may be comprised of a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it oscillates, measured in hertz (Hz). Most environmental vibrations consist of a composite spectrum of many frequencies and are generally classified as broadband or random vibrations. The normal frequency range of most groundborne vibration which can be felt generally starts from a low frequency of less than 1 Hz to a high of approximately 200 Hz.

Vibration energy spreads out as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. High frequency vibrations reduce much more rapidly than low frequencies, so that in the far-field from a source the low frequencies tend to dominate. Soil properties also affect the propagation of vibration. When groundborne vibration interacts with a building, a ground-to-foundation coupling loss may occur, but the vibration can also be amplified by the structural resonances of the walls and floors. Vibration in buildings is typically perceived as rattling of windows or items on shelves or the motion of building surfaces. The vibration of building surfaces can also be radiated as sound and heard as a low-frequency rumbling noise, known as groundborne noise.

Perceptible groundborne vibration is generally limited to areas within a few hundred feet of railway systems, certain types of industrial operations, and construction activities. Vibration intensive activities such as pile driving and sheet piling using impact hammers and large piles can produce perceptible vibration levels up to 700 feet from the source (Federal Transit Administration [FTA] 2006).

Building structural components can also be impacted by high levels of low-frequency noise (typically less than 100 Hz). The many structural components of a building, excited by low-frequency noise, can be coupled together to create complex vibrating systems. The low frequency vibration of the structural components can cause smaller items such as ornaments, pictures, and shelves to rattle, which can cause annoyance to building occupants. Human sensitivity to vibration varies by frequency and by person, but generally people are more sensitive to low-frequency vibration. Human annoyance is also related to the number and duration of events. The more events or the greater the duration, the more annoying it will be to humans.

Construction activities can produce varying degrees of ground vibration, depending on the equipment and methods employed. Construction activities that typically generate the highest levels of vibration are blasting and impact pile driving and sheet pile.

The vibratory ground motion is measured in terms of peak particle velocity (PPV) in the vertical and horizontal directions (vector sum), typically in units of inches per second (in/sec). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration and is often used in monitoring of blasting vibration because it is related to the stresses experienced by structures. For instance, a freight train passing at 100 feet can cause vibrations of 0.1 in/sec PPV, while a strong earthquake can produce vibration in the range of 10 in/sec PPV.

The vibration levels for typical human and structural responses and sources are shown in Table 4.8-2 below. Although the human perceptibility threshold for groundborne vibration is approximately 0.04 in/sec, human annoyance occurs when vibration exceeds 0.12 in/sec (FTA 2006). Background vibration (0.012 in/sec or lower) is usually well below the threshold of human perception and is of concern only when the vibration affects very sensitive manufacturing or research equipment.

Table 4.8-2. Typical Levels of Groundborne Vibration

Human/Structural Response	Velocity Level (inch/sec)	Typical Sources (at 50 feet)
Threshold, minor cosmetic damage fragile buildings	3.9	Blasting from construction projects, bulldozers and other heavy tracked construction equipment
Difficulty with vibration-sensitive tasks, such as reading a video screen.	1.2	Commuter rail, upper range
Residential annoyance, infrequent events	0.4	Rapid transit rail, upper range
		Commuter rail, typical range
Residential annoyance, frequent events	0.12	Bus or truck over bump
		Rapid transit rail, typical range
Limit for vibration-sensitive equipment, Threshold for human perception of vibration	0.04	Bus or truck, typical
None	0.012	Typical background vibration

Source: Adapted from Transit Noise and Vibration Impact Assessment (FTA 2006).

Typical vibration levels associated with use of different equipment are given in Table 4.8-3. The prediction of vibration through the soil at distances removed from the source is difficult to make as the soil/subsoil structure can vary considerably from one site to another. The transmission of vibration waves through soil and rock is mathematically very complex to calculate. When boundaries are present, such as layers of soil or rock or building foundations, then waves can be attenuated or enhanced by refraction and interference. Such phenomena are impossible to foresee.

Table 4.8-3. Vibration Levels of Various Equipment

Equipment	Vibration - Peak Particle Velocity (inch/sec) Distance from Source			
	50 feet	100 feet	200 feet	300 feet
Pile Driver, impact (high value), Sheet piling	0.537	0.190	0.067	0.037
Pile Driver, sonic (high value)	0.260	0.092	0.032	0.018
Caisson Drilling	0.031	0.011	0.004	0.002
Jackhammer, Large Bulldozer	0.012	0.004	0.002	0.001

Source: FTA 2006.

4.8.1.5 Lease Modification Project Area Overview

The Lease Modification Project involves installation of wedgewire screens and a diffuser on the subsurface end of the existing HBGS intake and discharge pipeline, respectively. Installation of the wedgewire screens will require the use of a pile-driver operated from a 180-ton derrick barge anchored above the intake pipeline riser. No modifications to onshore facilities are proposed. Construction activities would be restricted to the hours between 7 a.m. and 6 p.m., 7 days a week, for approximately 2 months for the diffuser and approximately 3 months for the wedgewire screens. The nearest residential area (sensitive receptor), the Huntington By-The-Sea Recreational Vehicle (RV) Park, is approximately 0.55 mile (2,900 feet) from the nearest proposed offshore work area. Nearby recreational areas include Huntington State Beach. (0.3 mile away); Huntington City Beach (0.7 mile distant); and the Huntington Beach Pier (approximately 1.6 miles away). The site is not located within an airport land use plan, within 2 miles of a public airport or public use airport, or in the vicinity of a private airstrip.

Noise in shallow water marine environments such as the Lease Modification Project site consists of a mixture of sources, including noise from ships and boats on the ocean surface, wind action on the water, surf, and, in some cases, biological noise from vocalizing species. No stationary sources of noise are present in the immediate vicinity.

4.8.2 Regulatory Setting

Appendix A summarizes relevant federal and state regulations. California Health and Safety Code section 46022 defines noise as “excessive undesirable sound, including that produced by persons, pets and livestock, industrial equipment, construction, motor vehicles, boats, aircraft, home appliances, electric motors, combustion engines, and any other noise producing objects.” Though guidelines and thresholds have been developed by the U.S. Environmental Protection Agency (USEPA) and State Department of Health Services (e.g., see Tables 12.19 and 12.20 in SWRCB (2015a), which are incorporated by reference), noise levels with few exceptions are regulated at the local level (counties, cities) through ordinances and land use planning and zoning laws. Noise requirements of the City were presented in the 2010 FSEIR and include several policies relevant to construction and operation of the proposed onshore HB Desalination Plant.

- **City Municipal Code Chapter 8.40** controls unnecessary, excessive and annoying sounds emanating from incorporated areas of the City.
- **Land Use Element Policy LU 12.1.7 (p. II-LU-42)** addresses the generation of unacceptable levels of noise
- **Noise Element Policy N 1.2.2 (p. V-N-6)** requires new industrial and new commercial land uses or major expansion of existing land uses to demonstrate that the new or expanded use would not be directly responsible for causing ambient noise levels to exceed an exterior Ldn of 65 dBA on areas containing "noise sensitive" land uses

4.8.3 Significance Criteria

The criteria for determining the significance of impacts for this analysis are the same that were used in the 2010 FSEIR to evaluate 2010 Project construction noise impacts, and are based on the State CEQA Guidelines Appendix G Checklist, specifically if Lease Modification Project construction activities (no anticipated changes in impact are associated with operations) would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

4.8.4 Environmental Impact Analysis and Mitigation

2010 PROJECT

In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to authorize HB Desalination Plant co-located and stand-alone operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted the following Findings and mitigation measures for noise (Item 62, October 29, 2010).

- The [2010 Project] will not generate a significant amount of noise resulting from mobile noise sources. Less than significant impact.
- The [2010 Project] would not generate a significant amount of noise resulting from long-term operations off site pipelines and underground booster pump stations.

The 2010 FSEIR found that onshore construction noise associated with the 2010 Project would increase the noise levels experienced by the surrounding sensitive

receptors in the community, but that adherence to City Municipal Code Chapter 8.40 requirements would ensure that, with mitigation, short-term construction noise impacts would be less than significant. Once operational, the noise levels caused by pumps at the proposed HB Desalination Plant site were identified in the 2010 FSEIR as potentially exceeding applicable City exterior noise standards. The 2010 FSEIR found that, with mitigation, the outdoor noise levels from the pumps would be less than significant. The adopted mitigation measures (MMs), **CON-15** and **NOI-1**, are discussed below.

SWRCB FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT (SED)

In its *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes*, the SWRCB (2015a) identified potentially significant impacts of noise and vibration related to the installation of intake and outfall structures in offshore waters. The analysis and recommended mitigation measures addressed (1) disturbance or interference with fish migration patterns due to underwater pile-driving noise and (2) disturbance of marine and onshore habitat through generation of noise and vibration. These issues are addressed in Section 4.1, *Ocean Water Quality and Marine Biological Resources*. Regarding noise associated with onshore construction and operation, the SED concluded:

> *Construction of desalination facilities will require heavy construction equipment and other activities that can generate noise levels exceeding local noise thresholds. Such impacts would be of temporary duration. Impacts from noise and vibration associated with the construction and operation of desalination facilities were similar between facilities and could be mitigated with appropriate design features such as proper scheduling proper notification and sound attenuating facility design. It is likely that other desalination facilities would have similar noise impacts and required mitigation would also be similar.*

ENVIRONMENTAL IMPACT ANALYSIS – LEASE MODIFICATION PROJECT

Proposed Lease Modification Project elements consist of offshore construction activities required to install wedgewire screens and a multiport diffuser on the HBGS pipelines, reduction in seawater intake volume (to 127 MGD for co-located and 106.7 MGD for stand-alone) through the new screens, and operation and maintenance of the screens and diffuser. Table 4.8-5 at the end of this section summarizes potential impacts and proposed mitigation measures.

Impact NOI-1: Construction and Operation Impacts in Excess of Applicable Community Noise Standards.

Noise levels associated with Lease Modification Project construction and operation would occur offshore and be short-term and would not create noise in excess of applicable community noise standards **(Less than Significant).**

Impact Discussion

The Lease Modification Project would involve dredging, 3 days of pile-driving, and other construction activities generated from a barge anchored offshore the City of Huntington Beach. The nearest recreational area is Huntington State Beach. (0.3 mile [1,500 feet] away) and the nearest residential area is the Huntington By-The-Sea RV Park, located approximately 0.55 mile (2,900 feet) away.

Onshore use of heavy-duty trucks and other construction equipment loaded onto ships would also occur at the Port of Long Beach (POLB), within the industrialized setting of the Long Beach Harbor District, so would not be subject to community noise standards. Noise generated by marine vessels used in Lease Modification Project activities would not differ from sounds made by similar marine vessels; the number of vessels required would be small compared to the number of existing calls at the POLB (POLB 2015) and existing marine vessel traffic in the area, which includes recreational, fishing, and sight-seeing boats and vessels supporting offshore oil platforms.

Construction-Phase Community Noise

Persons onshore would experience an increase in ambient noise levels from the offshore construction activities on the water's surface. The City of Huntington Beach provides an exemption for noise associated with construction and grading in Municipal Code, Noise Control, section 8.40.090, Special Provisions, provided that activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a State holiday. In general, all outdoor-living areas should be compatible with a CNEL of less than 65 dBA. Similarly, indoor-living spaces should be compatible with interior noise levels of less than CNEL 45 dBA (Dudek 2017).

The anticipated short-term noise levels generated during offshore construction would expose onshore receptors to higher daytime noise levels when equipment or vessels are used on the barge or conduct dredging and pile-driving below the water surface at the intake or discharge sites. Poseidon modeled construction noise levels at the nearest onshore and occupied noise-sensitive land uses. The modeling accounts for the equipment type and the number of each, the duty cycle for each piece of equipment (for example, the percentage of hours the equipment typically operates per day), and the distance from the noise-sensitive receiver to determine construction noise levels (Dudek 2016b, Dudek 2017). With various equipment in use offshore, including a crane, pumps, welder, and compressor, the onshore receivers most likely to experience increased noise levels from offshore construction would be residences at the Huntington By-The-Sea RV Park. Construction noise levels from the Lease Modification Project would range up to 57 dBA Leq. If intake and discharge construction were to overlap, the resulting combined noise levels at these residences would range up to 60 dBA Leq (Dudek 2017).

Since the worst-case noise level from combined construction of the intake and discharge modifications would range up to approximately 60 dBA Leq, onshore sensitive receptors would not be exposed to noise levels higher than applicable standards. Project-related noise levels would be below the significance threshold of 65 dBA. This impact would also occur only during the allowable hours of construction.

Furthermore, the 2010 FSEIR required implementation of **MM CON-15** to reduce noise levels generated during the construction phase of the 2010 Project to ensure that short-term construction noise impacts would be less than significant; this mitigation measure is currently required as a lease condition in PRC 1980.1. Since construction noise would be temporary, would only occur offshore during daylight hours, would implement noise reduction measures such as mufflers on construction equipment, and would cease upon completion of the Lease Modification Project, potential impacts of offshore construction noise would be less than significant.

Operation and Maintenance

The 2010 FSEIR identified impacts of pump noise and other long-term stationary equipment at the HB Desalination Plant as less than significant, with implementation of the adopted **MM NOI-1**, which requires all outdoor pumps to achieve acceptable levels as specified in the City Municipal Code, subject to post-construction monitoring. This measure would also apply to pump use after the wedgewire screens and multiport diffuser are installed. Maintenance of the intake screens and diffuser would require crew boats with divers to manually clean/inspect the offshore wedgewire intake screens during 1 or 2 days every 2 months (Dudek 2017). Cleaning ~~options~~would include both periodic manual cleaning by divers and~~shore-based or~~ boat-based air bursting, the latter of which would require use of an air compressor but would generate low non-impulsive noise levels. The level of maintenance activity using air bursting would vary depending on whether non-rotating or rotating wedgewire screens are installed. A rotating screen has continuously operating components designed to reduce maintenance visits. If this option is selected, components would rotate at a slow rate, which would avoid generating routine mechanical noise.

Mitigation Measures

No new mitigation measures have been identified. The following mitigation measures identified in the 2010 FSEIR and adopted by the City and CSLC as part of their 2010 Project approvals would continue to be implemented.

MM CON-15. Construction Noise Reduction. Requires mufflers on construction equipment, compliance with the City of Huntington Beach Municipal Code for Noise Control (chapter 8.40), notifying property owners of construction, use of noise attenuation methods where feasible, avoiding noise sensitive areas with haul trucks, and placing stationary equipment so that noise is emitted away

from sensitive noise receptors, all of which would further minimize any onshore impacts from construction noise.

MM NOI-1. Outdoor Pump Noise Reduction. Requires all outdoor pumps to achieve acceptable levels as specified in the City of Huntington Beach Municipal Code, subject to post-construction monitoring.

Impact NOI-2: Vibration Impacts to Sensitive and Recreational Receptors.

Short-term temporary vibration levels would increase during Lease Modification Project construction potentially affecting sensitive and recreational receptors **(Less than Significant).**

Impact Discussion

Offshore Lease Modification Project installation activities include the use of equipment for concrete cutting, dredging, moving riprap, and pile driving. Installation of the wedgewire screen intake and diffuser would occur approximately 1,500 to 1,650 feet offshore and would not create vibration perceptible to receptors on land. This impact would be less than significant. Operation and maintenance of the Lease Modification Project would involve a small number of worker vehicle trips and a crew boat, neither of which would generate groundborne vibration.

Mitigation Measures

No mitigation measures are recommended.

Impact NOI-3: Construction Noise Impacts in Excess of Ambient Noise Levels.

Project construction would occur offshore and would increase daytime noise levels in the vicinity of the Lease Modification Project site **(Less than Significant).**

Impact Discussion

Noise from construction depends on noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive receptors. With various equipment in use approximately 1,500 to 1,650 feet offshore, including a crane, welder, compressor, pile-driver and marine vessels, onshore receivers would experience increased noise levels. As quantified in the discussion of Impact NOI-1 above, construction noise levels from the Lease Modification Project would range up to 57 dBA Leq. If intake and discharge construction were to overlap, the resulting combined noise levels at these residences would range up to 60 dBA Leq (Dudek 2017). The 2010 FSEIR reported ambient noise levels at Huntington State Beach onshore of Lease PRC 1980.1 (see Table 4.8-4).

The Project's anticipated temporary noise levels from offshore construction would increase the ambient noise levels in the project site vicinity. This would expose onshore receptors to higher daytime noise levels. The increase in noise levels from offshore construction would be attenuated by the distance to proposed offshore activities. The change in noise levels would be short-term and would cease upon completion of the Lease Modification Project. This impact would be less than significant.

Table 4.8-4. Ambient Noise Levels (2010 FSEIR)

SITE NO. LOCATION	Leq (dBA)	Lmin (dBA)	Lmax (dBA)	PEAK (dBA)	TIME
Huntington State Beach, adjacent to the project site	47.1	41.2	57.2	82.8	10:25 a.m.

Source: City of Huntington Beach (2010).
Notes: 2010 FSEIR noise measurements were conducted on November 5, 2009, at sites representative of typical existing noise exposure within and immediately adjacent to the 2010 Project site. 10-minute measurements were taken at each site between 10:00 a.m. and 12:00 p.m.

Mitigation Measures

No additional mitigation measures are recommended. The following mitigation measure identified in the 2010 FSEIR and adopted by the City and CSLC as part of their 2010 Project approvals would continue to be implemented.

- **MM CON-15** (Construction Noise Reduction)

4.8.5 Cumulative Impacts

The 2010 FSEIR concluded that noise generated by HB Desalination Plant construction and operation would be less than significant. The analysis for this Supplemental EIR has been updated to consider current projects and the location of the Lease Modification Project.

Table 3-1 in Section 3, *Cumulative Projects*, presents the list of cumulative projects within the Project area. No individual projects in the cumulative impact study area are located offshore. The largest of the nearby onshore projects are the Magnolia Tank Farm Redevelopment Project and the HBGS Demolition and Replacement Project, which are separated from beach parking lots and beachfront and offshore areas by the Pacific Coast Highway (State Route [SR] 1). Thus onshore construction noise impacts would not readily combine with impacts from offshore construction associated with the Lease Modification Project. Construction of the Lease Modification Project would also be short-term and limited to a small offshore work area. The Lease Modification Project would not include any potential long-term noise except for occasional use of boats to perform maintenance.

Section 3, *Cumulative Projects*, describes a cumulative scenario that includes ongoing marine vessel traffic between the POLB and Orange County area. The number of

vessels required for the Lease Modification Project, however, is small compared to the number of existing calls at the POLB (POLB 2015) and existing marine vessel traffic in the area. Thus vessel traffic associated with the Lease Modification Project would not result in a cumulatively considerable noise impacts at the Lease Modification Project site or in the region.

Although cumulative development within the vicinity of the HB Desalination Plant would result in increased noise levels, the proposed Lease Modification Project would cause only nominal long-term operational noise levels, and on-site stationary noise sources associated with the HB Desalination Plant would be properly attenuated. Therefore, the Lease Modification Project–related contribution to a potentially significant cumulative long-term noise impact would not be cumulatively considerable and would therefore be less than significant.

4.8.6 Mitigation Measure/Applicant Proposed Measure Summary

Table 4.8-5 presents the mitigation measures from the project approved in 2010 and indicates whether each mitigation measure is also applicable to the Lease Modification Project.

Table 4.8-5. Impact and MM/APM Summary

Impact	MM/APM
2010 Project	
No significant impacts associated with noise were identified. Mitigation measures required in the 2010 FSEIR addressed onshore construction and operation activities.	• **2010 MM CON-15** (Construction and Noise Reduction) • **2010 MM NOI-1** (Outdoor Pump Noise Reduction)
Lease Modification Project	
NOI-1. Construction and Operation Impacts in Excess of Applicable Community Noise Standards.	No new measures recommended. Less than significant impacts would remain so with implementation of the following measures identified in the 2010 FSEIR: • **2010 MM CON-15** (see above) • **2010 MM NOI-1** (see above)
NOI-2: Vibration Impacts to Sensitive and Recreational Receptors	None recommended
NOI-3: Construction Noise Impacts in Excess of Ambient Noise Levels	No new measures recommended. Less than significant impacts would remain so with implementation of the following measures identified in the 2010 FSEIR: • **2010 MM CON-15** (see above)

4.9 RECREATION

In 2010, the city of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), analyzed impacts to recreational facilities and activities associated with construction and operation of the Huntington Beach Desalination Plant (HB Desalination Plant or 2010 Project) in Sections 4.1 (Land Use/Relevant Planning) and 4.6 (Public Services and Utilities) of its certified Final Subsequent Environmental Impact Report (2010 FSEIR). In 2016, Poseidon Resources (Surfside) LLC (Poseidon) submitted an application to the California State Lands Commission (CSLC) to amend Lease PRC 1980.1 to install, operate, and maintain wedgewire screens and a multiport diffuser on the offshore ends of the existing AES Huntington Beach Generating Station (HBGS) seawater intake and discharge pipelines (hereinafter referred to as the Lease Modification Project). This Supplemental EIR analyzes impacts to recreational facilities and activities associated with the proposed Lease Modification Project activities for the following reasons.

- The 2010 Project did not include the offshore construction activities that are contemplated in Poseidon's 2016 application.
- The 2010 FSEIR did not address potential impacts to recreational uses associated with construction in the Pacific Ocean offshore the City and Huntington State Beach.

Section 4.9 describes the offshore recreational activities in the Lease Modification Project area, evaluates the type and significance of potential impacts based on anticipated changes to existing conditions, and recommends measures if necessary to avoid or reduce significant impacts. The impact area evaluated includes areas near the seaward end of PRC 1980.1 where subsurface anchoring, dredging, riprap reconfiguration, and pile-driving activities are proposed. Recreational users along the Southern California coast can also be affected by aesthetic changes, as well as construction impacts like noise, dust, or vehicle emissions. Effects on aesthetics and scenic resources, which are often concerns for coastal recreationists, are evaluated in Section 4.2, *Aesthetics/Light and Glare*. In addition, the Project's air quality impacts are addressed in Section 4.3, *Air Quality*, and potential noise impacts are addressed in Section 4.8, *Noise and Vibration*.

4.9.1 Environmental Setting

As presented in the 2010 FSEIR, the City of Huntington Beach contains 70 parks with a total improved area of 594 acres. Coastal recreational activities include a recreational pier located approximately 1.6 miles northwest of the Lease Modification Project site, a marina, a wildlife preserve, an 8-mile biking, inline skating, jogging, and walking trail along the Pacific Ocean, and "8.5 miles of wide, spacious beaches where in the summer, large crowds gather to watch the special events" (City of Huntington Beach

2017b). Each summer, the City hosts the US Open of Surfing, billed as “the world's largest surf competition and lifestyle festival [where] over half a million people cruise the sand on the south side of the Huntington Beach Pier for nine free fun-filled days” (Surf City USA 2017). Other beach and ocean-related activities along the shoreline (in alphabetical order) include: beach volleyball, fishing, kite surfing, ocean swimming, recreational vehicle camping, and whale and dolphin watching.

Coastal recreational areas near the Lease Modification Project site include Huntington State Beach and Huntington City Beach, which are popular surfing and fishing areas. Anglers catch perch, corbina, croaker, cabezon, and shovelnose guitarfish during surf fishing, while California grunion runs draw crowds during the summer (California Department of Parks and Recreation 2017). Other well-visited areas are Magnolia Marsh and Brookhurst, located southeast and adjacent to the HBGS. Because of the wildlife at the Huntington State Beach and the Huntington Beach Wetlands, photography, educational tours (Huntington Beach Wetlands Conservancy 2017), and bird watching (Wetlands & Wildlife Care Center 2017) occur frequently.

Sportfishing in the deeper waters off Huntington Beach and Newport is also common. Three main port-based fishing communities in Orange County are (California Sea Grant 2017): Huntington Harbor (about 7.3 miles north of the project site) and Newport Beach and Balboa (about 3.4 miles south of the HBGS). Targeted fish in the area include calico bass, sand bass, barracuda, bonito, halibut, yellowtail, and white sea bass (Newport Landing 2017).

4.9.2 Regulatory Setting

Appendix A summarizes relevant federal and state regulations. Regulations related to recreation were not included in the 2010 FSEIR. No local regulations relevant to recreation would apply to the offshore area where the Lease Modification Project would be located.

4.9.3 Significance Criteria

The criteria for determining the significance of impacts for this analysis is based on concerns expressed by the public during scoping about the Lease Modification Project’s impact on access to recreational opportunities, specifically if the project would:

- Prevent access to recreational sites or disturb users of recreational facilities during times of peak use

The significance criteria for recreation applied in the 2010 FSEIR do not apply to the offshore Lease Modification Project because the project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the park would occur or be accelerated or include

recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

4.9.4 Environmental Impact Analysis and Mitigation

2010 PROJECT

The 2010 FSEIR found that all recreational impacts associated with constructing the HB Desalination Plant would be less than significant. Construction activities would occur in an area that includes nearby recreational uses, but would have a negligible impact on parks and recreation facilities in the City, including Huntington State Beach. Poseidon would be required to pay development impact fees prior to issuance of grading permits and to demonstrate compliance with parkland requirements identified in Chapter 254.08 (or Ordinance No. 3596) of the City's Zoning and Subdivision Ordinance. In 2010, the CSLC amended PRC 1980.1 to authorize co-located and stand-alone operations of the HB Desalination Plant on sovereign land for the remaining 20-year lease term (through August 7, 2026). The CSLC adopted the following Findings for recreation (Item 62, October 29, 2010).

- The [2010 Project] will not have a significant impact on the demand for parks and recreational facilities within the City of Huntington Beach. Less than significant impact.

SWRCB FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT (SED)

In its *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes*, the SWRCB (2015a) noted the following with respect to recreation.

> *The Desalination Amendment will not directly or indirectly cause increased use of regional parks or recreational facilities or require construction or expansion of new facilities because the scope of the Water Board's action relates only to the intake of seawater and discharge of brine in the coastal ocean environment. As determined on a case-by-case basis, the siting, construction and operation of individual desalination facilities will need to consider any potential impacts to recreation.*
>
> *As discussed in sections 12.1.13 and 12.1.14, the potential increase in growth could result in the use of and need for parks and recreational facilities. Therefore, it is possible that significant impacts from the need for recreation facilities may occur with implementation of a particular desalination facility, triggering the need to impose mitigation measures.*

Activities associated with the proposed Lease Modification Project, which include a reduced seawater intake flow and installation of wedgewire screens and a multiport

diffuser, would not cause an increase in local or regional growth, an issue addressed by the City (2010) in its certified 2010 FSEIR for the 2010 Project.

ENVIRONMENTAL IMPACT ANALYSIS – LEASE MODIFICATION PROJECT

Proposed Lease Modification Project elements consist of offshore construction activities required to install wedgewire screens and a multiport diffuser on the HBGS pipelines, reduction in seawater intake volume (to 127 MGD for co-located and 106.7 MGD for stand-alone) through the new screens, and operation and maintenance of the screens and diffuser. Table 4.9-1 at the end of this section summarizes potential impacts and proposed mitigation measures.

Impact REC-1: Impacts to Recreation and Recreational Access from Lease Modification Project Activities.

Use of a barge and vessels for offshore construction activities and vessels for intake and diffuser maintenance would prevent access to recreational areas during peak use **(Less than Significant Impact).**

Impact Discussion

Installation of the diffuser (1,500 feet offshore) and wedgewire screens (1,650 feet offshore) on the seaward ends of the existing HBGS intake and discharge pipelines would be performed from a 180-ton derrick barge anchored above the pipeline risers. Pile-driving activities (approximately 3 days in duration) would expose recreationists to temporary noise and vibration impacts (see Section 4.8, *Noise and Vibration*). Construction activities would be restricted to the hours between 7 a.m. and 6 p.m., 7 days a week, for approximately 2 months for the diffuser and approximately 3 months for the wedgewire screens.

Since construction would only be performed in offshore waters, the work would not impede access to recreation in City parks and recreational areas, including Huntington State Beach, and would not result in any permanent development onshore. Surfers, beach volleyball players, and other beachfront or surf zone users would not be directly affected by the construction of the screens and diffuser because of the distance of construction from the beach and surf zone, even during peak use periods such as during the US Open of Surfing. Overall, the impact of construction to onshore and nearshore recreationists would be less than significant.

Construction activities could potentially conflict with recreational boating, diving, and fishing activities in the offshore area. These vessels likely originate from local harbors. Lobster fishing also occurs in rocky areas such as under the Huntington Beach Pier. The intake and outfall pipelines are protected by riprap that may attract lobsters and reef-associated fish. This riprap would be moved and reconfigured during construction. Fish, lobster, and associated fishing activities, however, have not been documented in the

immediate vicinity of the intake and outfall pipelines, and since the riprap would be replaced, any disturbed invertebrates or fish would likely return once construction is complete. Because the area that would be precluded from recreational access during construction is very small compared to the expanse of ocean in the surrounding areas that would remain accessible to recreationists during the short construction period, potential impacts to boaters, divers, and sport fishers would be less than significant.

This less-than-significant impact to recreational boating and fishing would be further reduced through postings of U.S. Coast Guard (USCG) notices informing local boaters of potential obstructions during construction that are recommended to reduce potential impacts to marine transportation (see Section 4.10, *Transportation (Marine))*. The issuance of a Local Notice to Mariners (LNM) by the USCG as a result of this requirement would contain information on the locations, times, and details of activities that may pose hazards to mariners, such as the presence of barges, buoys, or other obstacles. The USCG issues LNMs on a monthly basis, with weekly supplements categorized by District Boundaries. As of April 1, 2004, LNMs are only available online.

During operation, the site would not visually stand out from the surrounding ocean, since both the screens and diffuser would remain submerged. No work crews would be permanently stationed at either the offshore diffuser or screen locations. During maintenance of the diffuser and wedgewire screens, a work crew would be deployed in a service boat that would be temporarily anchored over the offshore intake and outtake location. Poseidon estimates that maintenance would be completed within at most 10 hours, depending on the type of wedgewire screen installed. Regular maintenance of the diffuser would require quarterly dives to clean the external diffuser surfaces, and maintenance of the wedgewire screens would require inspection dives every 2 weeks during the first few months of operation. Depending on the observed biofouling rate, inspection and cleaning dives and boat-based air-burst cleaning would thereafter be conducted at a reduced frequency and are anticipated to be every other month~~quarterly~~. The short time required for maintenance activities and distance maintenance activities would be from shore would ensure that any impact to recreational access of maintenance activities would be temporary.

Mitigation Measures

Due to the low likelihood of the Project significantly impacting recreational opportunities for extended periods of time or during peak use, the impact to recreation is considered to be less than significant and no mitigation measures are recommended.

4.9.5 Cumulative Impacts

The 2010 FSEIR concluded that development of the HB Desalination Plant and other cumulative projects would be in compliance with all General Plan and Zoning designations and therefore would not result in any significant cumulative impacts to

recreation. The analysis for this Supplemental EIR has been updated to consider current projects and the location of the Lease Modification Project.

Table 3-1 in Section 3, *Cumulative Projects*, presents the list of cumulative projects within the Project area. No individual projects in the cumulative impact study area are located offshore. The largest of the nearby onshore projects are the Magnolia Tank Farm Redevelopment Project and the HBGS Demolition and Replacement Project, which are separated from beach parking lots and beachfront and offshore areas by the Pacific Coast Highway (State Route [SR] 1). Thus onshore construction impacts would not readily combine with impacts from offshore construction associated with the Lease Modification Project to affect recreational areas. Construction of the Lease Modification Project would also be short-term and limited to the small offshore work area and would be unlikely to affect peak use recreational activities.

Section 3, *Cumulative Projects*, describes a cumulative scenario that includes ongoing marine vessel traffic between the Port of Long Beach (POLB) and the Orange County area that could have potential cumulative impacts to recreational boating and fishing activities in the region. The number of vessels required for the Lease Modification Project, however, is small compared to the number of existing calls at the POLB (POLB 2015) and existing marine vessel traffic in the area. Thus vessel traffic associated with the Lease Modification Project would not result in a cumulatively considerable impact at the Lease Modification Project site or in the region. No mitigation is required.

4.9.6 Mitigation Measure/Applicant Proposed Measure Summary

Table 4.9-1 presents any applicable mitigation measures from the 2010 Project and indicates whether each mitigation measure applies to the Lease Modification Project. It also presents any new mitigation measures developed for this Supplemental EIR, which would only be applicable to the Lease Modification Project.

Table 4.9-1. Impact and MM/APM Summary

Impact	MM/APM
2010 Project	
No significant impacts associated ~~to~~ with recreation were identified in the 2010 FSEIR.	
Lease Modification Project	
REC-1: Impacts to Recreation and Recreational Access from Lease Modification Project Activities.	No new measures recommended. Less than significant impacts would remain so with implementation of the following measure identified in Section 4.10, *Transportation (Marine)*. **MM TRM-1**: Publication of U.S. Coast Guard (USCG) Local Notice to Mariners

4.10 TRANSPORTATION (MARINE)

In 2010, the city of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), analyzed construction-related impacts of transportation and traffic associated with construction and operation of the Huntington Beach Desalination Plant (HB Desalination Plant or 2010 Project) in Section 4.9 (Construction-Related Impacts) of its certified Final Subsequent Environmental Impact Report (2010 FSEIR). In 2016, Poseidon Resources (Surfside) LLC (Poseidon) submitted an application to the California State Lands Commission (CSLC) to amend Lease PRC 1980.1 to install, operate, and maintain wedgewire screens and a multiport diffuser on the offshore ends of the existing AES Huntington Beach Generating Station (HBGS) seawater intake and discharge pipelines (hereinafter referred to as the Lease Modification Project). This Supplemental EIR analyzes impacts of the Lease Modification Project on marine transportation for the following reasons.

- The 2010 Project did not include the offshore construction activities that are contemplated in Poseidon's 2016 application.
- The 2010 FSEIR did not address potential impacts to marine transportation in the Pacific Ocean offshore the City.

Section 4.10 discusses marine transportation in the Lease Modification Project area, evaluates the type and significance of potential impacts based on anticipated changes to existing conditions, and recommends measures if necessary to avoid or reduce significant impacts. The impact area evaluated includes areas near the seaward end of PRC 1980.1 where subsurface anchoring, dredging, riprap reconfiguration, and pile-driving activities are proposed.

4.10.1 Environmental Setting

Marine vessel traffic is often measured in numbers of port calls per vessel. According to the Port of Long Beach (POLB) 2015 Air Emissions Inventory (POLB 2015), in 2015:

- 1,988 ocean-going vessels (commercial vessels of 300 gross registered tons or more calling on California ports or places, excluding active military vessels [SWRCB 2015a], including large containerships, auto carriers, tankers, and other miscellaneous bulk carriers) departed the POLB, an average of 5.4 per day
- 87 harbor craft (including tugboats, crew boats, ferries, and other work boats) actively operated out of the Port (Table 8.6)

Marine vessel traffic within and approaching the POLB and Port of Los Angeles is managed through a Vessel Traffic Service (VTS), operated jointly by the U.S. Coast Guard (USCG) and Marine Exchange of Southern California (MXSocal). The purpose of the VTS "is to improve vessel transit safety by providing vessel operators with advance information of other reported marine traffic and any additional information, advice and

recommendations which may affect vessel traffic safety within the VTS area." (MXSocal and USCG 2015). Regional vessel traffic is also coordinated using Traffic Separation Schemes (TSSs), defined as a "routing measure aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes" (MXSocal and USCG 2015). The TSS that controls access to and from the POLB is divided into two approaches: Western and Southern. Each approach has a 1-mile-wide traffic lane, established on each side of the TSS.

The Lease Modification Project site is 10.5 miles outside of the Southern TSS Inbound Course. Vessel traffic in the nearby area includes: supply and crew boats to four offshore oil platforms—Edith, Elly, Eureka, and Ellen—located approximately 9 miles west; recreational boating, out of Huntington Harbour or other nearby harbors such as Newport Beach and Los Alamitos (about 7 miles to the south and north, respectively, of the worksite); and fishing, whale watching and SCUBA dive boats.

4.10.2 Regulatory Setting

Appendix A summarizes relevant federal and state regulations. Huntington Beach City Code, as amended in 2017, includes Section 13.08.135, Motorized Vessels, which prohibits boating within 1,000 feet of the mean high tide line unless authorized by the Director of Community Services (City of Huntington Beach 2017a).

4.10.3 Significance Criteria

Criteria set forth for transportation and traffic in the State CEQA Guidelines Appendix G Checklist apply primarily to onshore transportation (e.g., effects to intersections, streets, highways and freeways, pedestrian and bicycle paths, mass transit, congestion management programs [including, but not limited to level of service (LOS) standards], air traffic patterns, etc.) and are thus not applicable to the analysis of the offshore Lease Modification Project.

Therefore, consistent with other EIRs prepared by the CSLC for offshore projects in its jurisdiction, the following criterion would apply.

- Marine transportation impacts would be considered significant if the project would reduce the existing level of safety for navigating vessels or increase the potential for marine vessel accidents.

4.10.4 Environmental Impact Analysis and Mitigation

2010 PROJECT

The 2010 Project did not include marine vessels required to install offshore wedgewire screens or a diffuser; therefore, marine transportation was not analyzed in the 2010 FSEIR. In 2010, the CSLC, as a CEQA responsible agency, amended PRC 1980.1 to

authorize HB Desalination Plant operations on sovereign land for the remaining 20-year lease term (through August 7, 2026). As part of its approval, the CSLC made a finding that implementation of the 2010 Project may cause short-term, construction-related traffic impacts that would be avoided and minimized through implementation of a traffic management plan and other onshore traffic control-related mitigation measures (Item 62, October 29, 2010).

SWRCB FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENT (SED)

The SWRCB did not address marine transportation-related impacts in the SED. In its *Final Staff Report Including the Final Substitute Environmental Documentation Amending the Ocean Plan Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes*, the SWRCB (2015a) recognized that offshore construction related to the subsurface intake and outfall or diffuser could include excavation and emplacement activities requiring heavy equipment working offshore for a short-term duration (e.g., 1 to 4 months) by noting:

> *Barge or other vessel mounted dredging and pipe laying equipment, tug boats and support vessels would be necessary for seaward activities. Once construction of the project has been completed, the on-site activities would be limited to periodic monitoring and inspection. Some maintenance requiring construction or reconditioning would be necessary over the lifetime of an individual project.*

ENVIRONMENTAL IMPACT ANALYSIS – LEASE MODIFICATION PROJECT

Proposed Lease Modification Project elements consist of offshore construction activities required to install wedgewire screens and a multiport diffuser on the HBGS pipelines, reduction in seawater intake volume (to 127 MGD for co-located and 106.7 MGD for stand-alone) through the new screens, and operation and maintenance of the screens and diffuser. Table 4.10-1 at the end of this section summarizes potential impacts and proposed mitigation measures.

Impact TRM-1: Marine Vessel Safety.

Lease Modification Project activities have the potential to reduce the existing level of safety for marine vessels (**Less than Significant with Mitigation**).

Impact Discussion

As described in Section 2, *Project Description*, installation of the diffuser and wedgewire screens would generate marine vessel traffic between the POLB and the work site offshore of Huntington Beach. Construction would require one ~~tug~~ tugboat trip to deliver a crane barge to the site and one to remove it. The 180-ton derrick barge would be the largest vessel required for construction. Lease Modification Project activities would not

require any change in port areas, the regional VTS, other established marine traffic systems in the area, or existing aids to navigation.

An additional two or three vessels per day would shuttle crews to the site, deliver equipment and supplies, and conduct water quality and biological monitoring. These trips would have minimal effect on existing boat traffic during the short-term construction period, which is estimated at 2 and 3 months for installation of the diffuser and screens, respectively. If the installation of the diffuser and screens occurs concurrently, similar vessels and crews would work at each site. Vessel traffic offshore would be confined to the area directly surrounding the intake and discharge towers and to and from the POLB. Therefore, the vessel traffic offshore would not result in a significant impact on boat traffic.

Vessels transiting to and from the POLB and used onsite during the Lease Modification Project must meet USCG requirements for navigation safety (e.g., navigation systems, minimum crew, and COLREGS [International Regulations for Preventing Collisions at Sea] day shapes and night lights) and vessel operators would communicate with the USCG and VTS where applicable. Lease Modification Project activities are not likely to reduce the existing level of safety for navigating marine vessels in and around the POLB due to the small vessel sizes, small number of trips per day, use of existing vessel traffic services for coordinating movements into and out of the POLB, and short-term duration of construction. Thus, potential impacts at and transiting to and from the POLB would be less than significant.

At the Lease Modification Project site, vessel safety could be further increased with the publication of a Local Notice to Mariners to ensure that other vessels in the area, as well as the USCG and area harbor personnel, would be advised of the location of moored vessels, likely transit routes, and approximate dates, durations, and working hours. Noticing would provide for advanced planning and would ensure coordination with any other activities that are ongoing or planned. The USCG has a Local Notice to Mariners program and publishes weekly emails and notices for each USCG District (California is District 11). The Local Notice to Mariners addresses discrepancies in navigational aids (charts, etc.), advanced notices of projects (such as dredging, etc.) and other areas of potential concern (surveys, fireworks displays, sunken ships, etc.). The absence of advanced planning and failure to provide adequate notification to affected mariners or the USCG could cause a significant impact, which would be avoided by publication of a Local Notice to Mariners.

Upon completion of construction, the tops of the modified intake and discharge structures would be at approximately the same depth as the existing structures below the ocean surface at low water conditions. As illustrated in Figure 2-2 and 2-3 (Existing Intake Structure and Existing Discharge Structure), the intake and discharge risers (towers) on the ends of the existing HBGS pipelines are approximately 12 feet below

the surface of the ocean during low water conditions. These risers are located in waters sufficiently deep to vessel traffic that would normally operate in areas with water depths of approximately 33 feet mean lower low water. Prior to installation of the screens and diffuser, the tops of the risers would be demolished and lowered to accommodate the screens and diffuser. This would not result in a significant impact to marine vessel safety due to obstructions.

After operation begins, inspections of the submerged components by boat would occur. The diffuser would require quarterly dives to ensure its proper operation. Periodic maintenance trips, estimated at ~~less than one per month or 11~~ six dives per year, would also be made to clean/inspect the intake screens (different intake screen cleaning options are described in Section 2.4.6, *Operations and Maintenance*)~~, Manually cleaning of non-rotating wedgewire screens, if used, would result in the greatest number of diver visits~~. This would not result in a significant impact to marine vessel safety.

Mitigation Measures

MM TRM-1. Publication of U.S. Coast Guard (USCG) Local Notice to Mariners. The Applicant shall ensure that its contractor submits to the USCG District 11 (as stated at www.uscg.mil/D11/DP/LnmRequest.asp), a request to publish a Local Notice to Mariners, 14 days prior to operation, that includes the following information:

- Type of operation (i.e., dredging, diving operations, construction)
- Location of operation including Latitude and Longitude and geographical position if applicable
- Duration of operation including start and completion dates (if these dates change, the Coast Guard needs to be notified)
- Vessels involved in the operation
- VHF-FM Radio Frequencies monitored by vessels on scene
- Point of Contact and 24-hour phone number
- Chart Number for the area of the operation

4.10.5 Cumulative Impacts

The 2010 FSEIR concluded that the HB Desalination Plant would not result in a cumulatively considerable contribution to any significant cumulative transportation and traffic impacts onshore. The 2010 FSEIR did not evaluate marine transportation impacts. The analysis for this Supplemental EIR has also been updated to consider current projects and the offshore location of the Lease Modification Project.

Table 3-1 in Section 3, *Cumulative Projects*, presents the list of cumulative projects within the Lease Modification Project area. No individual projects in the cumulative impact study area are located offshore. Similarly, the nature and location of Lease Modification Project activities are physically separate from those of onshore projects

listed in Table 3-1 and would therefore not contribute to effects caused by those projects. No onshore traffic in the Huntington Beach area would be associated with the Lease Modification Project, and construction of the Lease Modification Project would be short-term and limited to the small offshore work area.

Section 3, *Cumulative Projects*, describes a cumulative scenario that includes ongoing marine vessel traffic between the POLB and Orange County area that could result in potential cumulative impacts in the region. The number of vessels required for the Lease Modification Project, however, is small compared to the number of existing calls at the POLB (POLB 2015) and existing marine vessel traffic in the area, which includes recreational, fishing, and sight-seeing boats and vessels supporting offshore oil platforms. Thus marine traffic associated with the Lease Modification Project would not result in a cumulatively considerable impact at the Lease Modification Project site or in the region. No mitigation is required.

4.10.6 Mitigation Measure/Applicant Proposed Measure Summary

Table 4.10-1 presents any applicable mitigation measures from the 2010 Project and indicates whether each mitigation measure applies to the Lease Modification Project. It also presents any new mitigation measures developed for this Supplemental EIR, which would only be applicable to the Lease Modification Project.

Table 4.10-1. Impact and MM/APM Summary

Impact	MM/APM
2010 Project	
Mitigation measures required in the 2010 FSEIR addressed only onshore transportation impacts.	
Lease Modification Project	
TRM-1: Marine Vessel Safety	**MM TRM-1**: Publication of U.S. Coast Guard (USCG) Local Notice to Mariners

5.0 ALTERNATIVES

5.1 INTRODUCTION

The California Environmental Quality Act (CEQA) requires the California State Lands Commission (CSLC) to analyze alternatives to a proposed project that could feasibly achieve the objectives of the project while substantially reducing significant environmental effects. As noted in Section 1, *Introduction*, in September 2010, the City of Huntington Beach (City), as CEQA lead agency, certified a Final Subsequent Environmental Impact Report (2010 FSEIR) in September 2010 and approved the construction and operation of the 50 million gallon per day (MGD) Huntington Beach Desalination Plant (HB Desalination Plant or **2010 Project**) at a site adjacent to the AES Huntington Beach Generating Station (HBGS) in the city of Huntington Beach, Orange County. The 2010 FSEIR evaluated alternatives to the 2010 Project. The CSLC is preparing this Supplemental Environmental Impact Report (EIR) to assess the changes in environmental impact resulting from Poseidon's proposed modifications to CSLC Lease PRC 1980.1 (hereinafter referred to **Lease Modification Project**). This section describes the CSLC's alternatives screening methodology, identifies alternatives eliminated from further consideration, and provides descriptions and impact analyses of each Lease Modification Project alternative considered. Section 6 identifies the environmentally superior alternative.

5.2 SELECTION OF ALTERNATIVES

5.2.1 Guidance on Alternatives Development and Evaluation

An important aspect of the environmental review process is the identification and assessment of reasonable alternatives that have the potential to avoid or reduce the significant impacts of a proposed project to allow for a comparative analysis for consideration by decision-makers. The State CEQA Guidelines provide the following guidance for evaluating alternatives in EIRs:

- An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. An EIR is not required to consider alternatives which are infeasible (State CEQA Guidelines, § 15126.6, subd. (a));
- The discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly (State CEQA Guidelines, § 15126.6, subd. (b));

- The range of potential reasonable alternatives to the project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. Among the factors used to eliminate alternatives from detailed consideration are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts (State CEQA Guidelines, § 15126.6, subd. (c)); and
- The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the project. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed (State CEQA Guidelines, § 15126.6, subd. (d)).

CEQA also requires an EIR to evaluate a "no project" alternative. The purpose of describing and analyzing a no project alternative is to allow decision-makers to compare the impacts of approving the project with the impacts of not approving the project. The analysis of the no project alternative must discuss the baseline conditions, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved.

5.2.2 Alternatives Screening Methodology

Alternatives to the Lease Modification Project were identified, screened, and either retained for further analysis or eliminated as described below. Alternatives were developed based on: input received from comments on the Notice of Preparation (NOP), information presented by the CSLC, comments received during consultation with the Santa Ana Regional Water Quality Control Board (RWQCB), State Water Resources Control Board and California Coastal Commission (CCC), and information provided by the Applicant. The Alternatives screening process consisted of the following steps:

Step 1: Define the alternatives to allow comparative evaluation.

Step 2: Evaluate each alternative using the following criteria:

- The extent to which the alternative would accomplish most of the basic goals and objectives of the Lease Modification Project (see Section 2.2, Project Objectives);
- The feasibility of the alternative, taking into account site suitability, economic viability, availability of infrastructure, General/Local Coastal Plan consistency, and consistency with other applicable plans and regulatory limitations; and
- The extent to which the alternative would avoid or lessen one or more of the significant environmental impacts of the Lease Modification Project.

Step 3: Determine the suitability of the proposed alternative for full analysis in the EIR based on Steps 1 and 2 above. Alternatives considered unsuitable were eliminated, with appropriate justification, from further consideration.

For the screening analysis, the technical and regulatory feasibility of potential alternatives was assessed at a general level. The assessment of feasibility was conducted by using "reverse reason" to identify anything about the alternative that would be infeasible on technical or regulatory grounds. CEQA does not require elimination of a potential alternative based on cost of construction and operation/maintenance.

At the screening stage, potential impacts of the alternatives or the Lease Modification Project cannot be evaluated with any measure of certainty; however, elements of the Project that are likely to be sources of impacts can be identified. Under both the proposed Lease Modification Project and alternatives, Poseidon would implement the mitigation measures adopted by the City of Huntington Beach and CSLC, as presented in the 2010 FSEIR. Poseidon would also implement additional Applicant Proposed Measures (APMs) for the Lease Modification Project that are identified in Section 2.5, *Applicant Proposed Measures*.

In general, characteristics used to eliminate alternatives from further consideration included:

- Limited effectiveness in reducing environmental impacts
- Engineering feasibility and safety
- Permitting feasibility
- Potential for adverse effects on air quality or marine resources
- Potential for inconsistency with adopted agency plans and policies
- Feasibility when compared to other alternatives under consideration

An alternative with infeasible characteristics was disregarded. Feasible alternatives that did not clearly offer the potential to reduce significant environmental impacts and infeasible alternatives were also removed from further analysis. In the final screening step, environmental advantages and disadvantages of the remaining alternatives were carefully weighed with respect to their potential for overall environmental advantage, technical feasibility, and consistency with Project objectives.

The State CEQA Guidelines require the consideration of a "no project" alternative and to identify, under specific criteria, an "environmentally superior" alternative. If the environmentally superior alternative is determined to be the "no project" alternative, the EIR must identify an environmentally superior alternative among the other alternatives (State CEQA Guidelines, § 15126.6).

5.2.2.1 Impacts of Major Concern

For the reasons described below, two resource areas are of particular importance in the consideration of alternatives for this Supplemental EIR: (1) ocean water quality and marine biological resources; and (2) air quality. For other resource areas, as documented in Sections 4.1 through 4.10, the implementation of the Lease Modification Project would result in minor increases or decreases to the less than significant impacts identified in the 2010 FSEIR, without changing any CEQA significance determinations.

- **Ocean Water Quality and Marine Biological Resources**. Impacts to ocean water quality and marine biological resources in the 2010 FSEIR were less than significant. The Lease Modification Project is being proposed to comply with the Desalination Amendment to the California Ocean Plan, which was enacted after 2010 and, in part, require impingement and entrainment reduction and adherence to specific salinity thresholds. The consideration of alternatives in this Supplemental EIR focuses on alternatives that would best achieve compliance with the Desalination Amendment.
- **Air Quality**. The only significant and unavoidable impact identified in the 2010 FSEIR was to regional air quality during construction of the HB Desalination Plant because construction emissions would exceed the daily threshold for NOx. Emissions from construction of the proposed Lease Modification Project would add to those of the HB Desalination Plant. The consideration of alternatives in this Supplemental EIR focuses on reducing this potentially significant impact.

5.2.3 Summary of Screening Results

Alternatives found to be technically feasible and consistent with the Lease Modification Project's objectives were then reviewed for their ability to reduce the potentially significant environmental impacts associated with the Lease Modification Project. Table 5-1 identifies potential alternatives to the proposed Lease Modification Project, and indicates if they were eliminated from further consideration (see rationale in Section 5.3, *Alternatives Eliminated from Further Consideration*), or fully described and evaluated in detail (see Section 5.4, *Alternatives Evaluated in this Supplemental EIR*).

Table 5-1. Summary of Alternatives Screening Results

Alternatives Evaluated in this Supplemental EIR	No Project Alternative
	Rotating Brush-Cleaned, Stainless Steel Wedgewire Screens Alternative
	Copper-Nickel Alloy Wedgewire Screens Alternative
	Six-port Diffuser Alternative
Intake and Discharge Alternatives Eliminated from Further Consideration in this Supplemental EIR	Intake Pipeline Extension Alternative

The alternatives listed in Table 5-1 are not an exhaustive list of potential options for the Lease Modification Project. The alternatives considered but eliminated from further consideration in the 2010 FSEIR were reconsidered as alternatives to the proposed Lease Modification Project, but were eliminated from consideration in this Supplemental EIR because they were 1) outside of the scope of this Supplemental EIR, or 2) for the same reasons as in 2010 FSEIR. These alternatives are listed as follows; the rationale for their elimination is presented in Section 5.3.~~4~~3:

- Alternative Site Alternative
- Alternative Ownership and Operation Alternative
- Alternative Facility Configuration
- Beach Well Intake Alternative (vertical intake wells, slant intake wells, and horizontal intake (Raney) wells)
- Subsurface Infiltration Gallery Intake Alternative
- Alternative Discharge Location (OCSD regional wastewater treatment facility)
- Alternative Discharge Design – Diffuser (velocity cap with 4 rectangular ports)
- Reduced Facility Size Alternative

In 2013, after certification of the 2010 FSEIR, two Independent Scientific and Technical Advisory Panels (ISTAPs) conducted a review of the feasibility of subsurface intake options for the Huntington Beach Desalination Plant. The ISTAP completed a more detailed analysis of an offshore Subsurface Infiltration Gallery, which was eliminated from further consideration as an intake alternative in the 2010 FSEIR. The ISTAP findings were considered in determining whether a Subsurface Infiltration Gallery should be evaluated in this Supplemental EIR. Ultimately, it was eliminated from consideration as described in Section 5.3.~~5~~4.

5.3 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

As noted in Section 1.2.2, *Santa Ana RWQCB Permitting Status*, the RWQCB is currently conducting its separate analysis pursuant to Water Code section 13142.5, subdivision (b), in accordance with the Desalination Amendment. The results of the RWQCB's analysis could result in a change to Poseidon's site, design, technology, or mitigation measures needed to conform to the Desalination Amendment, including the alternatives listed below.

5.3.1 Intake Pipeline Extension Alternative

5.3.1.1 Description

This alternative includes extending the existing HBGS intake pipeline farther offshore (from ~~1,840~~ 1,650 feet as proposed under the Lease Modification Project to 6,000 feet) and installing 1-millimeter wedgewire screens, as required under the Desalination Amendment. Under this alternative, the discharge pipeline would be the same as proposed under the Lease Modification Project; it would not be extended and the Applicant would install a diffuser.

Extending the existing pipeline farther offshore (from ~~1,840~~ 1,650 feet to 6,000 feet) would be accomplished through the following steps:

- Seal the openings on existing velocity cap
- Excavate west side of buried intake riser
- Penetrate existing intake riser or alternatively remove its modular rings
- Connect pipe extension to either existing intake riser or remaining intake pipe
- Install length of pipe required to extend to target offshore distance
- Lay new extension pipe using a trench and fill technique

5.3.1.2 Rationale for Elimination

At the request of the RWQCB, Poseidon evaluated whether extending the intake pipeline farther offshore would locate the intake withdrawal point in an area that would reduce intake entrainment effects in comparison to the proposed intake location. The study (HDR 2016a) found that the lowest larval density occurred at a sampling location approximately 6,636 feet (1.2 miles) offshore, but that the difference between larval densities at that sampling location and the proposed intake location were not statistically significant.

Extending the existing pipeline would result in substantial construction-related impacts, including impacts to marine biological resources and ocean water quality from seafloor disturbance, short-term increases in construction emissions, and impacts related to presence of marine vessel traffic and construction equipment.

This alternative would meet most project objectives and is potentially technically feasible, but would result in a substantial increase in construction-related impacts and would not reduce operational impacts. Therefore, this alternative was eliminated from further consideration.

5.3.2 Two-port Diffuser Alternative

5.3.2.1 Description

Under this alternative a diffuser would be installed with only two 30-inch ports. Intake modifications would be the same as the proposed Lease Modification Project. These ports could accommodate discharge of approximately 56.7 MGD, which would occur under the stand-alone operating scenario. With only two 30-inch ports, the initial discharge velocity would be 10 ft/sec. This alternative could not accommodate the discharge volume that would occur under co-located operations.

Installation methods would be the same as the proposed diffuser, except the additional work to close 4 of the 6 ports of the proposed diffuser as the HB Desalination Plant transitions from co-located to stand-alone operations would be eliminated. Elimination of this additional work would slightly reduce construction-related impacts.

Based on the trajectory, brine discharges would not interact with the ocean floor until the plume velocities have been substantially reduced and would comply with the salinity requirements of the Desalination Amendment.

5.3.2.2 Rationale for Elimination

This alternative would comply with Project objectives. However, it is not technically feasible as it could not accommodate the discharge volume that would occur under co-located operations. This alternative would only slightly reduce construction-related impacts of the proposed Lease Modification Project. Therefore, this alternative was eliminated from further consideration.

5.3.3 Alternatives Eliminated in the 2010 Final Subsequent Environmental Impact Report

The 2010 FSEIR considered several alternatives to the proposed HB Desalination Project, which comprised the desalination plant and other onshore components as well as use of the existing HBGS open ocean intake and discharge.

The following alternatives eliminated from consideration in the 2010 FSEIR are outside of the CSLC Lease Premises and therefore beyond the scope of this Supplemental EIR:

- **Alternative Site Alternative**. Considered several locations within 2 miles of the HBGS and outside of the City of Huntington Beach for the desalination facility.
- **Alternative Ownership and Operation Alternative**. The same proposed project, except owned and operated by a public entity.

- **Alternative Facility Configuration**. Rearrange the onshore buildings and equipment within the HBGS site to fit generally within the site boundaries identified in the 2005 Recirculated EIR.

The following 2010 FSEIR alternatives pertain to the intake and discharge components of the HB Desalination Plant, and therefore were considered for evaluation in this Supplemental EIR. However, each was ultimately eliminated from consideration in this Supplemental EIR for the same reasons presented in the 2010 FSEIR; these are summarized below.

Table 5-2. Intake/Discharge Alternatives Eliminated in 2010 FSEIR

Alternative Description	Rationale for Elimination (from 2010 FSEIR, also applicable to this Supplemental EIR)
Beach Well Intake. Considered 3 beach well designs: vertical intake wells, slant intake wells, and, horizontal intake (Raney) wells	Greater impacts to benthic and marsh habitat, public access, aesthetics, geology and soils, hazards, and product water quality.
Subsurface Infiltration Gallery Intake (Long Beach/Fukuoka-type). Man-made submerged slow sand media filtration beds located at the bottom of the ocean in the near-shore surf zone, which are connected to a series of intake wells	Greater impacts to benthic habitat, public access, traffic and transportation, greenhouse gas (GHG) emissions and waste disposal than the proposed Project.[1]
Alternative Discharge Location. Use of the 120-inch, 4.5-mile ocean outfall utilized at the Orange County Sanitation District (OCSD) regional wastewater treatment facility (located approximately 1.5 miles southeast of the proposed project site).	Technically infeasible because adequate capacity within the OCSD outfall is not available for the proposed desalination project
Alternative Discharge Design – Diffuser. Installation of a velocity cap retrofitted to the discharge tower, identical to the one that already exists on the intake tower. A velocity cap would provide four lateral diffuser ports with rectangular cross section, producing four horizontal discharge jets.	Reduced impacts from faster dilution of salinity beyond 600 feet from the outfall, but higher salinities on the seafloor within 600 feet from the outfall. Because the Lease Modification Project would not result in significant impacts related to elevated salinity the alternative does not avoid or reduce impacts.
Reduced Facility Size Alternative. Reduce the output of project water to approximately 25 MGD. This alternative would reduce the size of the facility, the amount of seawater required to produce water, and the amount of concentrated seawater discharged.	Would not achieve the Lease Modification Project's objectives (e.g., Contribute desalinated water to satisfy regional water supply planning goals), and would reduce overall water supply reliability that is sustainable and independent of climatic conditions. The alternative does not avoid or reduce significant impacts.

1 – After publication of the 2010 FSEIR, an Independent Scientific and Technical Advisory Panel conducted a detailed evaluation of the feasibility of a Subsurface Infiltration Gallery Intake (see Section 5.3.4~~7~~)

5.3.4 ISTAP Alternatives

As described in Figure 1-2 (Regulatory Timeline), an ISTAP was convened in two phases, and prepared two reports on the feasibility of subsurface intake alternatives. Table 5-3 summarizes the technologies considered by the two ISTAPs.

Table 5-3. Summary of ISTAP Subsurface Intake Alternatives

Phase	Intake Alternatives Found to be Feasible at Huntington Beach	Intake Alternatives Found to be Infeasible at Huntington Beach
ISTAP 1	Surf-zone infiltration gallery and Seafloor infiltration gallery	Vertical intake systems, including: ~~V~~vertical wells, radial wells, slant wells, and horizontal directional drilling and Water tunnels
ISTAP 2	Seafloor infiltration gallery, including: Trestle construction method and Float-in construction method	Surf-zone infiltration gallery

The alternatives eliminated in ISTAP Phase 1 were based primarily on the specific hydrogeology of the Huntington Beach area and the configuration of the groundwater basin near the coast.

The ISTAP Phase 2 Report evaluated in more detail the two alternatives found by the first ISTAP to be potentially feasible. The surf-zone infiltration gallery was determined to be infeasible based on the in consistent location of the surf zone itself. Frequent beach nourishment programs to maintain sand on Orange County beaches result in the periodic shifting of the location of the surf zone. Nourishment programs, by intent, create a larger beach and a more distant surf zone (further from the highway). As a result, the installation of piping that was always located below the surf zone would not be feasible.

5.3.4.1 Subsurface Infiltration Gallery (SIG)

The remaining potentially feasible subsurface intake alternative, the subsurface infiltration gallery (or SIG) was evaluated by ISTAP Phase 2. A SIG is a large expanse of buried offshore perforated pipes, connected through a series of header (collection) pipes to a large gallery of pumps located just onshore of the beach. Poseidon's engineer defined the best location for the SIG, based on seabed slope and consistent sandy sediments.

Based on an intake capacity demand of 106 MGD (necessary to produce 50 MGD of product water), the required total area for the SIG was determined to be approximately 25 acres. A total of 30 separate "cells" of connected pipes were defined to be required for the 106 MGD intake capacity. Each cell would be about 328 by 115 feet (just less than 1 acre per cell).

The ISTAP Phase 2 marine engineer developed two feasible construction techniques based on site-specific conditions. Both options would require 5 to 7 years to construct. They~~-~~ options are:

- SIG-Trestle: All construction would be performed from a fixed trestle elevated above the waves constructed from the shore to the SIG site at over 3 miles from shore; or
- SIG-Float-In: Prefabricated piping components would be assembled at the Port, and then floated from the Port to the SIG site.

The ISTAP was not tasked with preparing an environmental assessment of these two construction options, but the summary report did highlight the most severe impact concerns.

5.3.4.2 SIG Trestle Option

Due to the almost constant swell conditions at Huntington Beach, the construction methods for a SIG proposed by Poseidon in the 2005 and 2010 City of Huntington Beach EIRs assumed that all work would be performed from access trestles constructed for the purpose of installing the SIG. With this method, an elevated pile-supported platform would be built on the beach and a crane positioned on top of the platform. The crane then would be used to build a continuation of the platform or trestle through the surf zone into deeper water. As the trestle and crane advance offshore, additional construction materials are delivered to the crane working out on the end of the trestle. The trestle would look similar to the pier at Huntington Beach.

The trestle method is a proven and reliable method for nearshore construction in this area of the Southern California Coast. This method was used to successfully build the Huntington Beach municipal pier in 1989. However, due to the over 3-mile distance from shore and the extensive offshore area required for installation of the SIG itself (25+ acres), the total length of required access trestle in the Poseidon construction concept would be over 3.3 miles. While this method of construction is reliable, it would be very slow and expensive.

In addition, both SIG construction options would need a 4-acre gallery of pumps to pull seawater through the seabed sediments, into the perforated pipes and pipe headers, then into several parallel pipelines along the over 3 miles to shore. The pump gallery would be installed below grade in a portion of the Huntington Beach State Beach parking lot, and the pipelines from the pump gallery to the offshore SIG would be constructed by horizontal directional drilling from shore.

The environmental impacts of the trestle construction method would be substantial. They would include the construction impacts associated with the trestle itself, as well as those associated with installation the SIG piping and pumps. There would be a

significant amount of construction traffic on the streets of Huntington Beach, as well as construction noise on or near the beach, vehicle emissions and greenhouse gas emissions associated with trestle construction and use, significant disturbance to recreational beachgoers and boaters, a substantial reduction in the beachfront aesthetics, disturbance of coastal biological resources, obstruction of fishing opportunities, short-term effects on benthic habitat, and potential loss of income to the State Beach and beachfront businesses.

5.3.4.3 SIG Float-In Option

The primary objective of this alternate approach is to shift fabrication and assembly of large modular units to a protected harbor area where work can be conducted without concern for ocean swell conditions. The modular units would be transferred to the SIG installation site on a flat-deck barge for final installation, using bottom founded equipment.

This alternate float-in construction method significantly reduces on-site work and the sensitivity of construction operations to high energy wave conditions. This construction method provides the same shored-excavation for minimizing dredging quantities as the trestle method. However, the sheet piles used for the shoring would be pre-assembled onto a trussed frame into modular units within a protected harbor and then picked up as one unit by a transport barge. The barge would then be towed to the site and positioned by work boats at the proposed offshore SIG installation site. The modular units are then lowered to the sea floor. Once on the sea floor, a bottom founded, hydraulically operated, vibratory pile driver mounted to the outer rails of the assembly truss would walk its way around the edge of the truss and vibrate the sheet piles to grade. This driving installation would be performed in two stages. The first stage focuses on driving the sheet piles approximately 12 feet into the seabed and the second stage focuses on driving the sheet piles to grade. Following pile driving, the truss frame and vibratory pile hammer would be removed by the same transport barge and taken back to harbor for assembly, pickup, and transport of the next sheet pile cell.

After all sheet piles in a given cell are driven to grade, a traveling truss bridge with a span of 140 feet would be lowered onto the top of the sheet pile walls. This truss bridge would ride the top of the installed sheets and be equipped with a small hydraulic suction dredge. This dredge would be used to excavate to a depth of 12.5 feet within the sheet pile cell. The material dredged from within the sheet pile enclosed cell could be pumped to a bottom-dump barge for transport to deep water disposal or could be pumped ashore for temporary storage and later re-use for backfill.

Once dredging has been completed, the traveling truss and dredge would be lifted off the cofferdam walls and transported back to the harbor using the transport barge. A pre-assembled intake-piping grid for the SIG cell would then be picked up from an assembly

area in the harbor using the same truss frame and transport barge used for the cofferdam sheet piles. The piping grid would then be transported to site and lowered to grade within the pre-excavated SIG cell. The final step would be to bring back the traveling truss bridge, but this time equipped with a hopper for placement of the crushed gravel filter layers and sand backfill to bring the bedding in the cell back to original seabed elevation. Feed for this infill hopper would be from a floating barge positioned over the top of the cell. The final step would then be to use divers to connect the single 54" diameter collector header at the end of each of the 24 SIG cells to the four 72" diameter gallery inter-connect pipes.

The SIG float-in construction method would transfer some impacts from the City of Huntington Beach to the port where construction of prefabricated structures would be made and loaded onto barges. The other impacts would include the construction impacts associated with the installation of sheet pile enclosed cells, as well as those associated with installation the SIG piping and the onshore pumps. There would be less construction noise on or near the beach, and most vehicle emissions and greenhouse gas emissions associated with trestle construction and use would occur in Long Beach. There would be less disturbance to recreational beachgoers and boaters and to coastal biological resources. There would still be obstruction of fishing opportunities at the SIG site and short-term effects on benthic habitat. The loss of business income would be limited to the pump gallery effects.

5.3.4.4 SIG Conclusions

The second ISTAP concluded that both construction methods are feasible for constructing the SIG. The SIG options were found not to be economically viable at the Huntington Beach location within a reasonable timeframe, due to high capital costs.

5.4 ALTERNATIVES EVALUATED IN THIS SUPPLEMENTAL EIR

5.4.1 No Project Alternative

5.4.1.1 Description

If the proposed Lease Modification Project is not approved, the lease amendment approved by the CSLC in 2010 would remain in effect. The 2010 Project would not be modified to add the diffuser and wedgewire screens, and the construction effects of installation would not occur. The open ocean intake and the open discharge would remain in place. The impacts described in the 2010 FSEIR would occur. However, the HB Desalination Plant would not be in compliance with the intake or discharge requirements of the Ocean Plan Amendment for desalination projects.

5.4.1.2 Environmental Impact Analysis

Implementation of the No Project Alternative would eliminate the short-term offshore construction impacts associated with the proposed Lease Modification Project; for all resource areas except air quality these impacts would be less than significant. Under the No Project Alternative, construction emissions would be less than the HB Desalination Plant with the proposed Lease Modification Project, but would still be significant and unavoidable as described in the 2010 FSEIR.

Operation of the HB Desalination Plant under the No Project Alternative (i.e., without the proposed intake modifications and diffuser) would eliminate the potential collision hazard for marine vessels posed by the diffuser extending closer to the ocean surface than the existing discharge pipeline. Intake of ocean water would result in increased impingement and entrainment or marine organisms, but discharge without a diffuser would eliminate any entrainment due to shear stress. Discharge would also have higher salinity and poorer dissipation, which would increase impacts to marine biological resources and ocean water quality.~~, and~~ The No Project Alternative would violate the requirements of the Desalination Amendment if a screen and diffuser are not installed and the RWQCB, pursuant to Water Code section 13142.5, subdivision (b), determines subsurface intakes are not feasible and brine cannot be diluted by wastewater and there are no live organisms in the discharge.

5.4.2 Rotating Brush-Cleaned, Stainless Steel Screens Alternative

5.4.2.1 Description

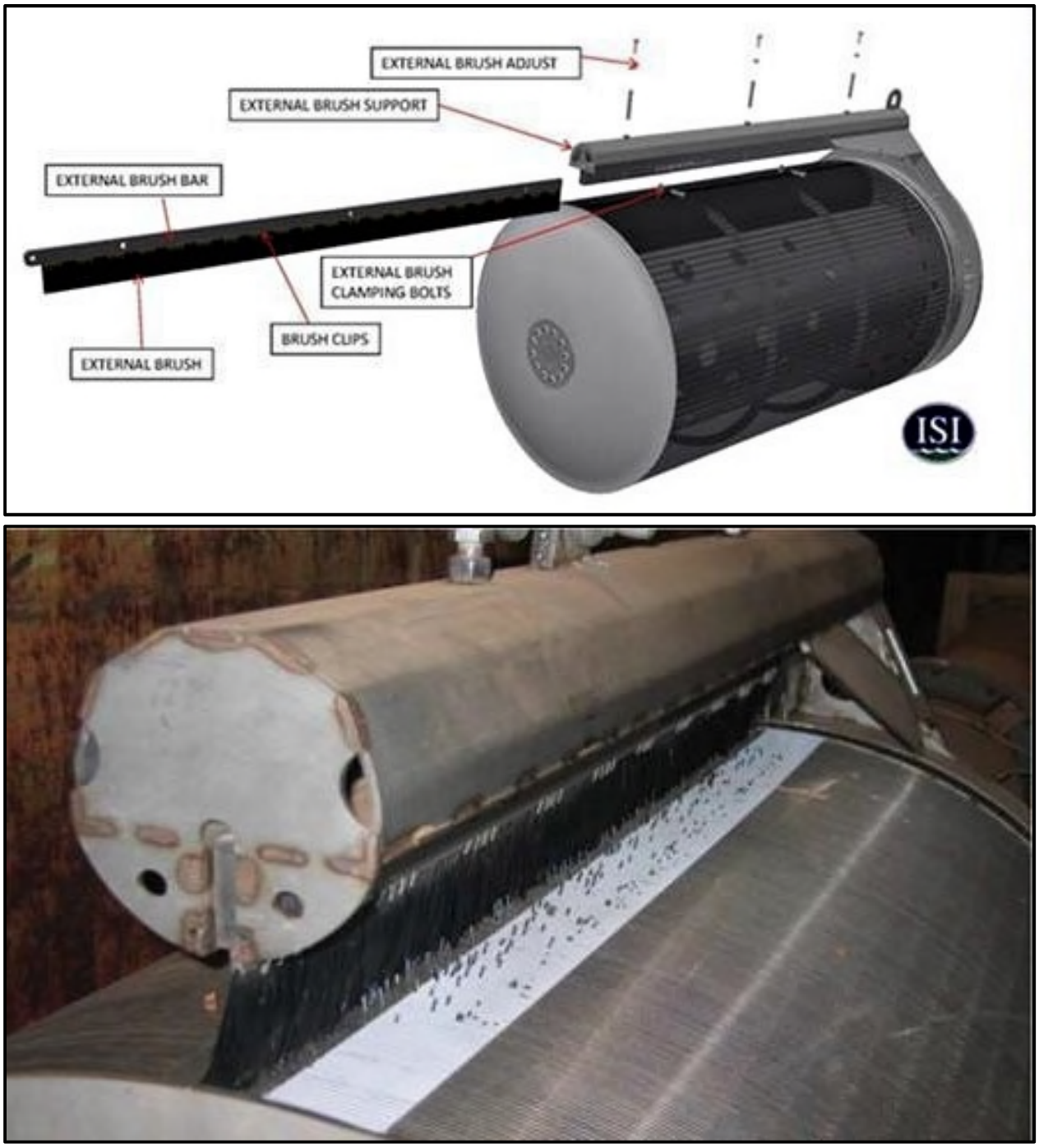
The selection of the appropriate material for the wedgewire screen array determines its maintenance. Wedgewire screens are typically available in stainless steel, duplex and super-duplex stainless steel, and copper nickel. Due to the salinity of the Pacific Ocean, the highest grade stainless steel is often preferred; however, selection of the screen material is often a balance between the need to resist corrosion and the need to resist biofouling.

If selected, rotating, brush-cleaned screens would be fabricated from high-grade stainless steel. Stainless steel has been shown to have better corrosion resistance than other metals, although the potential for biofouling is typically greater. However, because the screens would be mechanically rotated and automatically brush-cleaned, the external and internal screening surfaces should remain clear of fouling organisms. For screen components that are out of reach of the brush-cleaned surfaces, a silicone-based foul-release coating would be applied.

Installation methods would be the same as for the proposed wedgewire screens, however, the need for manual cleaning would be greatly reduced. Rotating screens, such as those manufactured by Intake Screen, Inc. (ISI), are designed so the screening

cylinders rotate past fixed internal and external brushes to keep the screens clean (See Figure 5-1). The screens would be continuously rotated at a slow rate either by an electric- or hydraulic driven motor. Quarterly dive trips would be required to inspect screens and to manually scrape unbrushed external screen surfaces, as needed.

Figure 5-1. Rotating, Brush-Cleaned Cylindrical Wedgewire Screen



Source: Images courtesy Intake Screen, Inc. (from Poseidon 2017b)

5.4.2.2 Environmental Impact Analysis

Implementation of this alternative wedgewire screen cleaning method would ~~eliminate~~ reduce, for the operational life of the HB Desalination Plant, the subsurface disturbance from anchor installation and occasional vessel traffic needed under the proposed boat-based air-burst wedgewire screen cleaning method. The proposed stationary stainless steel screens are anticipated to be inspected/cleaned every other month, for a total of six annual trips. The rotating brush-cleaned screens would be inspected/cleaned quarterly, for a total of four annual trips. This would slightly reduce the associated marine biological resource impacts and air quality emissions in comparison to the proposed Lease Modification Project.

Additionally, the stainless-steel screens that would be installed under this alternative would not leach copper into the water column or potentially adversely affect marine organisms, which would eliminate ~~this~~ the significant and unavoidable impact to water quality that would occur with the proposed solid copper-nickel, non-rotating wedgewire screens as proposed in Alternative 5.4.3.

5.4.3 Copper-Nickel Alloy Stationary Wedgewire Screens

5.4.3.1 Description

Poseidon's APM-8 provides for the possibility to install wedgewire screens with a mesh constructed of copper-nickel alloy, which some studies show is very resistant to biofouling (SWRCB 2015b), but that also corrodes easily. Copper from these screens may leach into the water column, resulting in degraded water quality. High copper levels in the ocean have been found to reduce the abundance of plankton, acidians, and echinoderms (SWRCB 2015b). The release of copper is a complex process influenced by diffusion from the solid surface, dissociation of the copper oxide, leaching into seawater, dispersion by currents, flocculation, and burial in sediments. According to Michel et al. (2011), leaching levels from direct surface measurements of solid copper-nickel have not been extensively evaluated.

Ocean Plan Water Quality Objectives for Protection of Marine Life limit copper to a 6-month median of 3 micrograms per liter (µg/L), a daily maximum of 12 µg/L, and an instantaneous maximum of 30 µg/L (SWRCB 2015b). Installation of copper-nickel alloy screens would trigger Ocean Plan requirements related to copper leaching, including toxicity testing requirements and compulsory sampling and analyses to determine compliance with effluent limitations.

5.4.3.2 Environmental Impact Analysis

Copper-nickel wedgewire screens would require less frequent manual cleaning than stainless steel screens and boat-based air-burst maintenance due to the material's

biofouling resistance, lowering the associated emissions and seafloor disturbance. However, in the absence of an available suitable standard to assess copper releases from solid copper-nickel screens, the impact to ocean water quality from wedgewire screen leaching cannot be quantified or assessed, and could be potentially significant. If wedgewire screens with copper-nickel alloy mesh were placed into the ocean, no mitigation measures are currently available to reduce potentially significant impacts of copper leaching to ocean water quality. If chemical leaching exceeds Ocean Plan Water Quality Objectives, this impact would be potentially significant and unavoidable, even with implementation of Poseidon's APMs to reduce impacts to ocean water quality.

5.4.4 Six-Port Diffuser Alternative

5.4.4.1 Description

This alternative entails installation of a six-port diffuser, with four 42-inch and two 30-inch ports, during co-located operations (Alden 2016). The four 42-inch ports would be closed to facilitate the transition to stand-alone operations. The CSLC also considered the scenario in which all six ports would remain open during stand-alone operations. Diffuser installation methods and intake modifications would generally be the same as the proposed Lease Modification Project. However, leaving all six ports open for stand-alone operations would eliminate the need for an extra trip and the associated work to close ~~two~~ four of the ports upon transitioning from co-located to stand alone operations.

Based on the trajectory, brine discharges would not interact with the ocean floor until the plume velocities have been substantially reduced and would comply with the salinity requirements of the Desalination Amendment.

5.4.4.2 Environmental Impact Analysis

The six-port diffuser design alternative has two potential configurations.

- All six ports are open during co-located operations, with four ports closed and two ports open during stand-alone operations.
- All six ports are open during both co-located and stand-alone operations.

Regarding co-located operations, with all six ports open, Poseidon did not provide data to indicate that diffuser-related entrainment mortality would differ from the proposed Lease Modification Project. However, considering the low velocity of the 6-port stand-alone with all ports open (1.79 feet/second [ft/s]; see Appendix F1) and that co-located operations would discharge only 21 MGD more than stand-alone operation, jet velocity for this 6-port diffuser alternative under co-located operations would likely be more than stand-alone with all six ports open but less than the proposed Lease Modification Project; therefore, diffuser-related entrainment mortality would likely be less under this

alternative in comparison to the proposed Lease Modification Project, but the area of the BMZ could be greater.

According to Dr. Peter Raimondi (refer to Appendix F1), in stand-alone operations, with four ports closed and two ports open, this alternative would have a maximum velocity of approximately 10 ft/s and would attain regulatory compliance for salinity within an estimated approximately 21 meters (distance to diffusers). This alternative design is likely to have similar impacts with respect to diffuser-related entrainment mortality and area of the BMZ as the currently proposed diffuser design.

In stand-alone operations, with all six ports open, the maximum jet velocity would be approximately 1.79 ft/s and regulatory compliance for salinity would be achieved within 98 meters. This alternative would likely have reduced diffuser-related entrainment mortality, but a larger BMZ, than the currently proposed diffuser design. (Refer to Appendix F1.) In addition, retaining all six ports for the stand-alone operations would eliminate the extra trip and the associated work to close two of the ports and would slightly reduce temporary marine biological resource impacts and air quality emissions in comparison to the proposed Lease Modification Project.

In summary, impacts from a diffuser with all six ports open during co-located operations, and with four ports closed and two ports open during standalone operations, would be similar to the proposed Lease Modification Project except for diffuser-related entrainment mortality, which would likely be less under co-located operations than the proposed Lease Modification Project.

Impacts of a diffuser with six ports open during both the co-located and standalone operation would likely be less than the proposed Lease Modification Project because the temporary impacts associated with closing the port would be eliminated. In addition, diffuser-related entrainment would likely be less under both co-located and stand-alone operations. While the BMZ would likely be greater than the proposed Lease Modification Project, under stand-alone operation the discharge would achieve regulatory compliance within approximately 98 meters (with a shorter distance anticipated for co-located operation). Although this calculation falls within the 100 meters allowed pursuant to the Desalination Amendment, the margin for error is too close to this limit.

Page Intentionally Left Blank

6.0 OTHER REQUIRED CEQA SECTIONS AND ENVIRONMENTALLY SUPERIOR ALTERNATIVE

As noted in Section 1, *Introduction*, in September 2010, the City of Huntington Beach (City), as lead agency under the California Environmental Quality Act (CEQA), certified a Final Subsequent Environmental Impact Report (2010 FSEIR) in September 2010 and approved the construction and operation of the 50 million gallon per day (MGD) Huntington Beach Desalination Plant (HB Desalination Plant or **2010 Project**) at a site adjacent to the AES Huntington Beach Generating Station (HBGS) in the city of Huntington Beach, Orange County. Continuing as a CEQA responsible agency, the California State Lands Commission (CSLC) has prepared this Supplemental Environmental Impact Report (Supplemental EIR) to evaluate the potential significant environmental effects associated with the Seawater Desalination Project at Huntington Beach: Outfall/Intake Modifications & General Lease — Industrial Use (PRC 1980.1) Amendment (hereinafter referred to as **Lease Modification Project**).

The Lease Modification Project proposes to add two components to the existing HBGS intake and outfall pipelines, which are located on 11.78 acres of tide and submerged land under the jurisdiction of the CSLC under Lease PRC 1980.1: (1) 1-millimeter (mm) wedgewire screens with a through-screen velocity 0.5 feet/second (ft/s) or less to the offshore terminus of the seawater intake line to reduce potential entrainment and minimize impingement and (2) a seawater diffuser to the offshore terminus of the seawater brine discharge line to enhance brine mixing with seawater.

The State CEQA Guidelines (found in Cal. Code Regs., title 14, § 15000 et seq.) state in part that an EIR shall:

- Identify and focus on the significant environmental effects of a proposed project (§ 15126.2, subd. (a))
- Describe any significant impacts, including those that can be mitigated but not reduced to a level of insignificance (§ 15126.2, subd. (b))
- Identify significant irreversible environmental changes that would be caused by a proposed project should it be implemented (§ 15126.2, subd. (c))
- Identify any growth-inducing impacts of a proposed project such as the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment (§ 15126.2, subd. (d))
- Identify any known areas of controversy or unresolved issues (§ 15123, subd. (b))
- Identify the environmentally superior alternative (§ 15126.2, subd. (e)(2))

These elements are discussed in Sections 6.1 through 6.4 below. The following discussion applies to all three potential operational scenarios (co-located operations, temporary stand-alone operations, and permanent operations), so they are not addressed separately.

6.1 SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Section 4.0, *Environmental Impact Analysis*, of this Supplemental EIR focuses on the significant environmental impacts anticipated as a result of the Lease Modification Project and identifies mitigation measures to reduce potential significant impacts. State CEQA Guidelines section 15126.2, subdivision (b), requires that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. The significant unavoidable impacts (i.e., impacts that cannot be reduced to a level of insignificance) associated with the Lease Modification Project relate to emissions of criteria air pollutants from the construction and operation of the Lease Modification Project that alone would not exceed quantitative thresholds for ozone precursors, PM10, and PM2.5, but would combine with the significant impact of construction NOx emissions for the overall HB Desalination Plant. Additional significant unavoidable impacts associated with the Lease Modification Project involve impacts to marine mammals from underwater construction noise~~, possible ocean water quality impacts from the wedgewire screen, and impacts to special status populations from the diffuser operations~~.

Table 6-1 shows the Significant and Unavoidable impacts disclosed in this Supplemental EIR.

Table 6-1. Summary of Project Significant and Unavoidable Impacts

SEIR Section	Impact Number and Impact
Ocean Water Quality and Marine Biological Resources (Section 4.1)	**Impact OWQ/MB-3**: Impact to Special Status Species Populations and Movement of Marine Mammal Species as a Result of Underwater Noise during Construction ~~**Impact OWQ/MB-5**: Impact to Ocean Water Quality from Wedgewire Screen and Diffuser Operation and Maintenance~~ ~~**Impact OWQ/MB-7**: Impact to Special Status Species Populations of Diffuser Operation~~
Air Quality (Section 4.3)	**Impact AQ-1**: Air Emissions from Construction **CMLTV-AQ-1**: Cumulative Air Emissions from Construction

6.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES CAUSED BY PROPOSED ACTION IF IMPLEMENTED

State CEQA Guidelines section 15126.2, subdivision (c), states that significant irreversible environmental changes that would be involved with a proposed project may include the following:

- Uses of non-renewable resources during the initial and continued phases of the project, which would be irreversible because a large commitment of such resources makes removal or non-use thereafter unlikely;
- Primary impacts and, particularly, secondary impacts which commit future generations to similar uses;
- Irreversible damage, which may result from environmental accidents associated with the project; and
- Consumption of resources is not justified (e.g., the project results in the wasteful use of energy).

Determining whether a proposed project may result in significant irreversible environmental changes requires a determination of whether key resources would be degraded or destroyed such that there would be little possibility of restoring them. Because of potentially significant unavoidable impacts to ocean water quality and marine biological resources, some degradation or destruction of resources is anticipated as a result of the Lease Modification Project although measures are proposed to mitigate the impacts to the maximum extent feasible. On open ocean intake pipelines, wedgewire screens are required under the Desalination Amendment; likewise multiport diffusers must be used if brine is not diluted with other wastewater.

While the Lease Modification Project would represent a long-term commitment of the HBGS intake and outtake pipe modifications to the associated onshore desalination uses, such uses are consistent with applicable goals and policies of the City's General Plan. Various natural resources, in the form of construction materials and energy resources, would be used to construct the Lease Modification Project, but their use is not expected to result in significant long-term shortfalls in the availability of these resources.

~~The~~ Although the Lease Modification Project would ~~continue the trend of reliance on~~ use non-renewable fossil fuels during construction and ~~consumption~~ through O&M, the consumption of small amounts non-renewable fuel resources would be necessary to support the Project's association with the desalination facility. ~~and the facility's related local and larger scale environmental impacts, such as~~ Consumption of non-renewable fossil fuels for the Lease Modification Project would cause small quantities of GHG emissions that would not have a significant impact on the environment and would not substantially contribute to global GHG emissions or climate change as discussed for the HB Desalination Plant in Section 4.12 (Climate Change) of the 2010 FSEIR and for the proposed for the Lease Modification Project in Section 4.6 of this Supplemental EIR.

6.3 GROWTH-INDUCING IMPACTS OF PROPOSED ACTION

State CEQA Guidelines section 15126.2, subdivision (d), states that growth-inducing impacts of the proposed Project must be discussed in the EIR. In general terms, a project may induce spatial, economic, or population growth in a geographic area if it meets any one of the four criteria identified below:

- Removal of an impediment to growth (e.g., establishment of an essential public service or the provisions of new access to an area);
- Economic expansion or growth (e.g., changes in revenue base or employment expansion);
- Establishment of a precedent-setting action (e.g., an innovation, a change in zoning, or general plan amendment approval); or
- Development or encroachment in an isolated area or one adjacent to open space (i.e., being different from an "infill" type of project).

Should a project meet any one of the criteria listed above, it can be considered growth inducing. The impacts of the proposed Project are evaluated below with regard to these four growth-inducing criteria.

The Lease Modifications would not remove an impediment to growth or result in the establishment of an essential public service, and they would not provide new access to an area previously inaccessible. The Lease Modification Project would not result in increased permanent employment in the area; very short-term construction jobs would be created, but only between 13 and 23 per day during the different construction phases. During maintenance activities, employment would include approximately 4 service crew members and a minimum of 2 divers for ~~quarterly~~ six annual wedgewire screen maintenance/inspection trips.

The Huntington Beach (HB) Desalination Plant itself would have operational activities that could result in an increase in the revenue base for the State of California and Orange County via the sale of product water generated from the HB Desalination Plant. While this revenue would be associated with the construction and use of the diffuser and wedgewire screens as analyzed in this Supplemental EIR, the Lease Modifications on their own would generate no revenue. Also, according to the 2010 FSEIR, the HB Desalination Plant would not produce water in excess of what is already anticipated to meet future projected needs in Orange County (City of Huntington Beach 2010). Overall, the Lease Modification Project is not expected to have any additional growth-inducing impacts.

In addition, the Lease Modification Project would not establish a precedent-setting action that could lead to growth nor would it develop or encroach in an isolated area or one adjacent to open space. The Proposed Project would not foster economic or

population growth or the construction of additional housing in the surrounding environment. Accordingly, the Lease Modification Project is not considered to be growth-inducing.

6.4 KNOWN AREAS OF CONTROVERSY OR UNRESOLVED ISSUES

State CEQA Guidelines section 15123, subdivision (b)(2), requires EIRs to contain a brief summary of areas of known controversy including issues raised by agencies and the public. Building a desalination plant on the southern California coast that could supply millions of gallons of drinking water to citizens, but the operation of which would require withdrawal of nearly twice as much seawater from the Pacific Ocean, will generate controversy and receive a high level of public scrutiny. Such projects require balancing of potential impacts to sensitive marine biological resources, water quality and air quality, among other considerations, during project construction and operation against the perceived need for potable water. In 2010, the City balanced impact and need in certifying the 2010 FSEIR and approving the 2010 Project, but the controversy remains. According to the 2010 FSEIR, the Applicant has pursued the development of a seawater desalination facility at the AES HBGS site in Huntington Beach since 1999 (City 2010). Nearly 7 years after the City approved the 2010 Project, Poseidon has not obtained all its required permits to construct or operate the HB Desalination Plant.

Many issues raised by agencies and the public during public scoping for the Lease Modification Project, which would modify the offshore pipelines associated with PRC 1980.1, address perceived changed circumstances in the past 7 years, including:

- The need for the 2010 Project in light of recent water conservation actions, demand forecasts, and water availability
- New or emergent issues related to the HB Desalination Plant, such as changes in ocean water quality regulations with adoption of the Desalination Amendment and issues that were not addressed in the 2010 FSEIR (e.g., onshore site inundation associated with sea-level rise, increased seismic and coastal hazards)
- Lease Modification Project operation and timing – for example, both the Santa Ana Regional Water Quality Control Board (RWQCB) and California Coastal Commission (CCC) stated that if the HB Desalination Plant is not fully constructed and in operation until after the HBGS ceases intake of seawater, then the 2010 Project as amended with the proposed lease modifications would only operate under stand-alone, not co-located, conditions (letters from Kurt Berchtold, RWQCB, and Tom Luster, CCC, to Cy Oggins, CSLC, December 21, 2016)
- The level of CEQA review for the Lease Modification Project given that additional CEQA review may be needed to build a site-specific onshore system to distribute potable water. For example, according to California Coastkeeper Alliance:

> *All EIRs, including subsequent EIRs, must evaluate the "whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment." From this principle, it is clear that the requirements of CEQA 'cannot be avoided by chopping up proposed projects into bite-sized pieces' which, when taken individually, may have no significant adverse effect on the environment" (letter from California Coastkeeper Alliance et al. to Cy R. Oggins, CSLC, December 21, 2016).*

These areas of known controversy are addressed in this Supplemental EIR, including in Section 1.4.1, *CSLC 2010 Approval and Rationale for Supplemental EIR*). They will also be evaluated by the CSLC in its consideration of potential significant impacts, mitigation measures and alternatives, and in any decision whether to approve the Lease Modification Project and impose lease conditions if approved.

6.5 COMPARISON OF PROPOSED ACTION AND ALTERNATIVES AND ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Section 5.0, *Alternatives*, describes the alternatives that are analyzed in this Supplemental EIR and those that were considered, but were eliminated from analysis. In addition to the No Project Alternative, ~~two~~ three intake and discharge alternatives were evaluated: the rotating brush-cleaned, stainless steel wedgewire screens alternative, the copper-nickel alloy wedgewire screens alternative, and the six-port diffuser alternative (six ports open for co-located operation, two ports open for stand-alone operation). Table 6-2 compares key components of each alternative that may affect impact severity. Table 6-3 compares impact significant levels.

Based on the analysis contained within the Supplemental EIR, the CSLC has determined that the Lease Modification Project with the **Rotating Brush-Cleaned, Stainless Steel Wedgewire Screens Alternative** is the Environmentally Superior Alternative.

Table 6-2. Comparison of Alternatives

Lease Modification Project	Alternatives			
	No Project Alternative (2010 Project)	Wedgewire Screen		Six-Port Diffuser Alternative
		Rotating Brush-Cleaned, Stainless Steel	Copper-Nickel Alloy	
FEATURES				
• Reduced intake volume compared to 2010 Project • Three duckbill nozzle diffuser with a central port that would be capped (closed) during stand-alone operation • Four wedgewire screens • Assumes regular maintenance by divers ~~or~~and boat-based air-burst cleaning of screens	• Higher seawater intake volume was approved in 2010 • Open ocean intake and discharge approved in 2010 • No offshore construction required • No maintenance of screens or diffuser	• Reduced intake volume compared to 2010 Project • Initial installation of screens similar to Lease Modification Project • Operation uses screens that rotate against a wire brush to scrape material from screen surface • Less maintenance for rotating screens (reduces ~~or eliminates~~ need for boat trips/anchoring over the operating life of the Poseidon HB Desalination Plant) ~~but potential for more biofouling for stainless steel than copper~~	• Reduced intake volume compared to 2010 Project • Initial installation of screens similar to Lease Modification Project • Less maintenance than stainless steel screens due to lower potential for biofouling • Potential chemical leaching into surrounding water	• Reduced intake volume compared to 2010 Project • Six-port diffuser installed for co-located operation • Four ports would be closed in separate construction action prior to stand-alone operation • Wedgewire screen installation and maintenance same as proposed Lease Modification Project
CONSTRUCTION IMPACTS				
• More extensive seafloor disturbance than 2010 Project • Greater construction air emissions than 2010 Project	No offshore construction, therefore no seafloor disturbance or additional air emissions	• More extensive seafloor disturbance than 2010 Project • Greater construction air emissions than 2010 Project • Similar construction-related impacts compared to Lease Modification Project	• Similar construction-related impacts compared to Lease Modification Project	• More extensive seafloor disturbance than 2010 Project • Greater construction air emissions than 2010 Project • Similar construction-related impacts compared to Lease Modification Project

Table 6-2. Comparison of Alternatives

Lease Modification Project	Alternatives			
	No Project Alternative (2010 Project)	Wedgewire Screen		Six-Port Diffuser Alternative
		Rotating Brush-Cleaned, Stainless Steel	Copper-Nickel Alloy	
WATER QUALITY				
Screens composed of stainless steel. ~~copper-nickel alloy may result in~~ No chemical leaching.	No screens	~~Screens composed of stainless steel. No copper leaching. More biofouling likely~~ No significant difference in water quality impacts compared to Lease Modification Project	Screens composed of copper-nickel alloy may result in chemical leaching	No significant difference in water quality impacts compared to diffuser proposed for Lease Modification Project
INTAKE IMPINGEMENT				
Reduced seawater intake volume compared to 2010 Project	Not identified as significant impact in 2010 FSEIR	Similar to Lease Modification Project	Similar to Lease Modification Project	N/A
INTAKE AND DISCHARGE ENTRAINMENT (CO-LOCATED)				
88 million larvae (Intake); same as 2010 Project	Not identified as significant impact in 2010 FSEIR	Similar to Lease Modification Project	Similar to Lease Modification Project	N/A
529~~121~~ million larvae (Diffuser); greater than 2010 Project (zero larvae)	Not identified as significant impact in 2010 FSEIR	N/A	N/A	Additional ports provide small reduction in discharge entrainment mortality compared to Lease Modification Project
INTAKE AND DISCHARGE ENTRAINMENT (STAND-ALONE)				
74 million larvae (Intake); approximately 29 million fewer compared to 2010 Project	Not identified as significant impact in 2010 FSEIR	Similar to Lease Modification Project	Similar to Lease Modification Project	N/A
543~~125~~ million larvae (Diffuser); greater than 2010 Project (zero larvae)	Not identified as significant impact in 2010 FSEIR	N/A	N/A	No significant difference compared to Lease Modification Project
AIR EMISSIONS				
73.85 lb/day of NOx during construction	39 to 182 lb/day of NOx during construction	Operations emissions slightly higher than proposed	Similar to the Lease Modification Project	Similar to Lease Modification Project

Table 6-3. Impact Summary: Lease Modification Project and Alternatives

IMPACT *[Impact Class: SU = Significant and Unavoidable; LTSM = Less than Significant with Mitigation; LTS = Less than Significant; NI = No Impact]*	Impact Class				
		ALTERNATIVES			
	Lease Modification Project [2]	No Project (2010 Project)	Wedgewire Screen		Six-Port Diffuser [2]
			Rotating Brush-Cleaned, Stain-less Steel[1]	Copper-Nickel Alloy[1]	
SECTION 4.1 OCEAN WATER QUALITY AND MARINE BIOLOGICAL RESOURCES					
OWQ/MB-1: Impact to Ocean Water Quality of Lease Modification Project Construction Activities	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
OWQ/MB-2: Impact to Special Status Species Populations of Intake Screen and Diffuser Installation (Not Including Underwater Noise)	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
OWQ/MB-3: Impact to Special Status Species Populations and Movement of Marine Mammal Species as a Result of Underwater Noise during Construction	**SU**	**NI**	**SU**	**SU**	**SU**
OWQ/MB-4: Spread of Invasive and Non-Native Marine Species in the Ocean	**LTSM**	**NI**	**LTSM**	**LTSM**	**LTSM**
OWQ/MB-5: Impact to Ocean Water Quality from Wedgewire Screen and Diffuser Operation and Maintenance	~~**SU**~~ **LTS**	**NI**	**LTS**	**SU**	~~**SU**~~ **LTS**
OWQ/MB-6: Impact to Special Status Species Populations of Intake Flow Reduction (Compared to 2010 Project) and Use and Maintenance of Wedgewire Screens	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
OWQ/MB-7: Impact to Special Status Species Populations of Diffuser Operation	~~**SU**~~ **LTS**	**NI**	~~**SU**~~ **LTS**	**LTS**	~~**SU**~~ **LTS** ↓
SECTION 4.2 AESTHETICS/LIGHT AND GLARE					
ALG-1: Visual Impacts from Offshore Construction Activities	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
ALG-2: Creation of New Sources of Substantial Light or Glare such as Nighttime Illumination	**LTSM**	**LTS**	**LTSM**	**LTSM**	**LTSM**

Table 6-3. Impact Summary: Lease Modification Project and Alternatives

IMPACT *[Impact Class: SU = Significant and Unavoidable; LTSM = Less than Significant with Mitigation; LTS = Less than Significant; NI = No Impact]*	Impact Class				
		ALTERNATIVES			
	Lease Modification Project [2]	No Project (2010 Project)	Wedgewire Screen		Six-Port Diffuser [2]
			Rotating Brush-Cleaned, Stain-less Steel[1]	Copper-Nickel Alloy[1]	
SECTION 4.3 AIR QUALITY					
AQ-1: Air Emissions from Construction	SU	SU	SU	SU	SU
AQ-2: Creation of Objectionable Odors Affecting a Substantial Number of People	LTS	LTS	LTS	LTS	LTS
AQ-3: Consistency with Regional Air Quality Plan	LTS	LTS	LTS ↑-↓	LTS ↓	LTS
CMLTV-AQ-1: Cumulative Air Emissions from Construction	SU	SU	SU	SU	SU
SECTION 4.4 CULTURAL RESOURCES					
CUL-1: Change in Significance of Previously Recorded Historical or Unique Archaeological Resources	NI	NI	NI	NI	NI
CUL-2: Change in Significance of Previously Unidentified Historical or Unique Archaeological Resources	LTSM	NI	LTSM	LTSM	LTSM
CUL-3: Construction or operation of the Lease Modification Project could damage or destroy paleontological resources	LTS	NI	LTS	LTS	LTS
CUL-4: Disturb Unidentified Human Remains	LTSM	NI	LTSM	LTSM	LTSM
SECTION 4.5 CULTURAL RESOURCES—TRIBAL					
TCR-1: Change in Significance of Previously Recorded Tribal Cultural Resources	NI	NI	NI	NI	NI
TCR-2: Change in Significance of Previously Unidentified Tribal Cultural Resources	LTSM	NI	LTSM	LTSM	LTSM
SECTION 4.6 GREENHOUSE GAS EMISSIONS					
GHG-1: GHG Emissions from Project Activities	LTS	LTS	LTS ↑	LTS↓	LTS
GHG-2: Consistency with Applicable GHG Plan, Policy, or Regulation	LTS	LTS	LTS	LTS	LTS

Table 6-3. Impact Summary: Lease Modification Project and Alternatives

IMPACT *[Impact Class: SU = Significant and Unavoidable; LTSM = Less than Significant with Mitigation; LTS = Less than Significant; NI = No Impact]*	Impact Class				
		ALTERNATIVES			
	Lease Modification Project [2]	No Project (2010 Project)	Wedgewire Screen		Six-Port Diffuser [2]
			Rotating Brush-Cleaned, Stainless Steel[1]	Copper-Nickel Alloy[1]	
SECTION 4.7 HAZARDS AND HAZARDOUS MATERIALS					
HAZ-1: Construction and Operation Impacts of Routine Hazardous Material Transport, Use, or Disposal	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
HAZ-2: Release of Hazardous Materials through Reasonably Foreseeable Upset and Accident Conditions	**LTSM**	**LTS**	**LTSM**	**LTSM**	**LTSM**
SECTION 4.8 NOISE AND VIBRATION					
NOI-1. Construction and Operation Impacts in Excess of Applicable Community Noise Standards.	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
NOI-2: Vibration Impacts to Sensitive and Recreational Receptors	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
NOI-3: Construction Noise Impacts in Excess of Ambient Noise Levels	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
SECTION 4.9 RECREATION					
REC-1: Impacts to Recreation and Recreational Access from Lease Modification Project Activities.	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
SECTION 4.10 TRANSPORTATION (MARINE)					
TRM-1: Marine Vessel Safety	**LTSM**	**NI**	**LTSM**	**LTSM**	**LTSM**

Notes:

[1] Includes three duckbill nozzle diffuser with center port from the proposed Lease Modification Project

[2] Includes ~~copper-nickel~~ stationary stainless steel wedgewire screen from the proposed Lease Modification Project as amended by the Applicant on June 26, 2017.

↑ Increased effect compared to other alternatives

↓ Decreased effect compared to other alternatives

Page Intentionally Left Blank

7.0 MITIGATION MONITORING PROGRAM

Under the California Environmental Quality Act (CEQA), the California State Lands Commission (CSLC) is required to adopt a program for reporting or monitoring regarding the implementation of mitigation measures for the Lease Modification Project, if approved, to ensure that the adopted mitigation measures are implemented as defined in this Supplemental Environmental Impact Report (Supplemental EIR). This responsibility originates in Public Resources Code section 21081.6, subdivision (a) (Findings), and the State Guidelines for Implementing CEQA sections 15091, subdivision (d) (Findings), and 15097 (Mitigation Monitoring or Reporting).

7.1 MONITORING AUTHORITY

The purpose of a Mitigation Monitoring Program (MMP) is to ensure that measures adopted to mitigate or avoid significant impacts are implemented. A MMP can be a working guide to facilitate not only the implementation of mitigation measures by the project proponent, but also the monitoring, compliance and reporting activities of the CSLC and any monitors it may designate.

The CSLC may delegate duties and responsibilities for monitoring to other environmental monitors or consultants as deemed necessary, and some monitoring responsibilities may be assumed by responsible agencies, such as affected jurisdictions and cities. The number of construction monitors assigned to a project will depend on the number of concurrent construction activities and their locations. The CSLC or its designee(s), however, will ensure that each person delegated any duties or responsibilities is qualified to monitor compliance.

Any mitigation measure study or plan that requires the approval of the CSLC must allow at least 60 days for adequate review time. For the proposed Lease Modification Project, when an Applicant Proposed Measure (APM) or mitigation measure requires that a mitigation program be developed during the design phase of the Project, Poseidon Resources (Surfside) LLC (Poseidon or Applicant) must submit the final program to the CSLC for review and approval at least 60 days before construction begins. Other agencies and jurisdictions may require additional review time. The environmental monitor assigned to project implementation or installation of a project component is responsible for ensuring that appropriate agency reviews and approvals are obtained.

The CSLC or its designee will also ensure that any deviation from the procedures identified under the monitoring program is approved by the CSLC. Any deviation and its correction shall be reported immediately to the CSLC or its designee by the environmental monitor.

7.2 ENFORCEMENT RESPONSIBILITY

The CSLC is responsible for enforcing the procedures adopted for monitoring through the environmental monitor. Any assigned environmental monitor shall note problems with monitoring, notify appropriate agencies or individuals about any problems, and report the problems to the CSLC or its designee.

7.3 MITIGATION COMPLIANCE RESPONSIBILITY

Poseidon is responsible for successfully implementing all the mitigation measures in the MMP, and shall ensure that these requirements are met by all of its construction contractors and field personnel. Standards for successful mitigation also are implicit in many mitigation measures that include such requirements as obtaining permits or avoiding a specific impact entirely. Other mitigation measures include detailed success ~~11~~ criteria. Additional mitigation success thresholds may be established by applicable agencies with jurisdiction through the permit process and through the review and approval of specific plans for the implementation of mitigation measures.

7.4 GENERAL MONITORING PROCEDURES

7.4.1 Environmental Monitors

Many of the monitoring procedures will be conducted prior to or during the construction phase of the Lease Modification Project. The CSLC and the environmental monitor(s) are responsible for integrating the mitigation monitoring procedures into the construction process in coordination with the Applicant. To oversee the monitoring procedures and to ensure success, the environmental monitor must be on site during that portion of construction that has the potential to create a significant environmental impact or other impact for which mitigation is required. The environmental monitor is responsible for ensuring that all procedures specified in the monitoring program are followed.

7.4.2 General Reporting Procedures

Site visits and specified monitoring procedures performed by other individuals will be reported to the environmental monitor. A monitoring record form will be submitted to the environmental monitor by the individual conducting the visit or procedure so that details of the visit can be recorded and progress tracked by the environmental monitor. A checklist will be developed and maintained by the environmental monitor to track all procedures required for each mitigation measure and to ensure that the timing specified for the procedures is adhered to. The environmental monitor will note any problems that may occur and take appropriate action to rectify the problems.

7.4.3 Public Access to Records

The public is allowed access to records and reports used to track the monitoring program. Monitoring records and reports will be made available for public inspection by the CSLC or its designee on request.

7.5 MITIGATION MONITORING TABLE

This section presents the mitigation monitoring table (Table 7-1) for each environmental discipline that requires mitigation measures. Table 7-1 includes those MMs and APMs that are required to avoid, minimize, or mitigate the potential impacts of the Lease Modification Project only. The CSLC is responsible for ensuring the implementation of these measures. For mitigation measures from the 2010 FSEIR that are unchanged and also applicable to the Lease Modification Project, CSLC would coordinate with the City of Huntington Beach to ensure their implementation. Impacts that do not require mitigation are not included (see Executive Summary for summary description of all Project impacts). Each table lists the following information, by column:

- Impact (impact number, title, and impact class);
- Mitigation Measure (full text of the measure);
- Location (where the impact occurs and the mitigation measure should be applied);
- Monitoring/reporting action (the action to be taken by the monitor, CSLC or lead agency);
- Effectiveness criteria (how the agency can know if the measure is effective);
- Responsible agency; and
- Timing (before, during, or after construction; during operation, etc.).

The APMs as identified in Section 2.5 of the Project Description are presented at the end of the table. Mitigation measures identified are either:

- A measure in the 2010 Final Subsequent Environmental Impact Report (FSEIR) that is also required to reduce impacts of the Lease Modification Project
- A measure in the 2010 FSIER FSEIR that was modified in this Supplemental EIR
- A new mitigation measure identified in this Supplemental EIR

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
4.1 OCEAN WATER QUALITY AND MARINE BIOLOGICAL RESOURCES						
Impact OWQ/MB-1: Impact to Ocean Water Quality of Lease Modification Project Construction Activities	**APM-1: Offshore Construction Best Management Practices (BMPs) to Protect Water Quality.** Poseidon's offshore construction contractor shall implement BMPs to protect water quality during offshore demolition and construction, including the control of releases of sediment, coarse particles, concrete, and other materials. The implementation of these BMPs shall be a required part of the contractor's contract for offshore construction work. The BMPs shall be submitted for review and approval by California State Lands Commission (CSLC) staff at least 30 days before the commencement of offshore construction. CSLC may also consult with the Regional Water Quality Control Board **staff** and the California Coastal Commission staff in considering the BMPs. The BMPs shall include, at a minimum, the following measures. • All metals used in construction shall be marine-grade fasteners and metals that will not corrode, releasing zinc or other toxic material into the water. • The contractor shall implement effective and practicable measures to limit offshore construction debris that could be discharged to the sea floor (e.g., use of mesh nets). After completion of offshore construction, the contractor shall perform a diver survey to identify if hazardous materials (e.g., sharp-edged scraps of metal, cables) have been left onsite. All such materials shall be	HB Generating Station intake and discharge pipelines	Approval of BMPs by CSLC staff and project monitor to confirm that the offshore construction contractor implements the BMPs	Implementing the BMPs would reduce impacts to water quality during offshore demolition and construction	CSLC	During construction activities

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	removed within 72 hours after completion of offshore construction unless a longer timeframe is approved by CSLC staff.					
	APM-2: Turbidity Minimization and Monitoring Plan. At least 30 days before commencement of offshore construction, Poseidon shall submit a Turbidity Minimization and Monitoring Plan for review and approval by California State Lands Commission (CSLC) staff. CSLC may also consult with Santa Ana Regional Water Quality Control Board and California Coastal Commission staff in considering the Turbidity Minimization and Monitoring Plan. The Plan shall include, at a minimum, the following elements: • Maximum allowable turbidity levels associated with offshore construction as provided by the California Ocean Plan during offshore construction activities • All measures Poseidon will implement to remain within maximum allowable turbidity levels, including maintenance monitoring to ensure that the Desalination Amendment turbidity requirements are achieved • Types of equipment to be used to conduct offshore construction activities • Equipment and sediment disposal locations • Qualifications of the observers who will be present at the offshore project site to monitor for turbidity during offshore construction activities (names shall be submitted at the same time or within 1 week of project implementation) • A Monitoring Plan that (1) provides for	HB Generating Station intake and discharge pipelines	Approval of a Turbidity Minimization and Monitoring Plan by CSLC staff	Implementing a Turbidity Minimization and Monitoring Plan would reduce impacts to water quality during offshore demolition and construction	CSLC	At least 30 days before offshore construction begins

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	measuring turbidity within 72 hours and immediately before offshore construction begins to provide baseline levels and monitoring during offshore construction to ensure the construction operator remains within those levels and (2) identifies the location of a control or reference site so a high turbidity reading caused by a large-scale or regional event is not inappropriately attributed to offshore project construction					
	APM-3: Spill Prevention and Response Plan. At least 60 days before commencement of offshore construction, a Spill Prevention and Response Plan for all vessels to be used for project activities shall be prepared by Poseidon and submitted for review and approval by California State Lands Commission (CSLC) staff that includes at a minimum the following elements: • A list of all fuels and hazardous materials that will be used or might be used during offshore construction, along with Material Safety Data Sheets for each material • Specific protocols for monitoring and minimizing the use of fuel and hazardous materials during offshore construction project operations, including best management practices that will be implemented to ensure minimal impacts to the environment • An estimate of a reasonable worst case release of fuel or other hazardous materials at the offshore construction project site or into coastal waters resulting from the	HB Generating Station intake and discharge pipelines	Approval of a Spill Prevention and Response Plan by CSLC staff	Implementing a Spill Prevention and Response Plan would reduce impacts to water quality during offshore demolition and construction	CSLC	At least 60 days before offshore construction begins

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	offshore construction activities • A list of all spill prevention and response equipment that will be maintained on the vessels performing the offshore construction activities • The designation of the on-site person with responsibility for implementing the plan • A detailed response and clean-up plan in the event of a spill or accidental discharge or release of fuel or hazardous materials • A telephone contact list of all regulatory and trustee agencies, including CSLC and California Coastal Commission staffs, having authority over the development and/or the project site and its resources to be notified in the event of a spill or material release.					
	APM-4: Workers Educational Training. A worker education training program shall be conducted for workers engaged in offshore construction. The contents of the training program shall be prepared by a qualified biologist approved by California State Lands Commission (CSLC) staff. The program shall include at a minimum the following elements. • Measures to prevent indirect impacts during construction and maintenance activities shall be covered, including delivery, storage, and use of materials and chemicals as they relate to the protection of aquatic habitat. • Training materials should include laws and regulations that protect federally-listed species and their habitats, the consequences of non-compliance with laws and regulations and a contact person (i.e., maintenance activity manager) in the event	HB Generating Station intake and discharge pipelines	Approval of a qualified biologist to prepare a worker education training program	Implementing a worker education program would reduce impacts to biological resources during construction and maintenance activities	CSLC	During construction activities

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	that protected biological resources are affected. • Training shall take place at the kick-off meeting and any subsequent meetings that may take place if additional contractors are employed during additional maintenance activities. A sign-in sheet will be circulated for signatures to all personnel that attend the workers' educational training to confirm that program materials were received and that they understand information presented.					
Impact OWQ/MB-2: Impact to Special Status Species Populations of Intake Screen and Diffuser Installation (Not Including Underwater Noise)	**APM-3:** see Impact OWQ/MB-1 above	HB Generating Station intake and discharge pipelines	Approval of BMPs by CSLC staff and project monitor to confirm that the offshore construction contractor implements the BMPs	Implementing the BMPs would reduce impacts to Special Status Species populations	CSLC	During construction activities
	APM-4: see above Impact OWQ/MB-1 above	HB Generating Station intake and discharge pipelines	Approval of a qualified biologist to prepare a worker education training program	Implementing a worker education program would reduce impacts to Special Status Species populations during construction and maintenance activities	CSLC	During construction activities
	APM-5: Sensitive Marine Species Monitoring and Best Management Practices (BMPs) to Protect Marine	HB Generating Station	Approval of a Sensitive Marine Species Monitoring	Implementing a Sensitive Marine Species	CSLC	At least 30 days before offshore

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	Biological Resources. At least 30 days before commencement of offshore construction, Poseidon shall submit a Sensitive Marine Species Monitoring and Mitigation and BMP Implementation Plan for review and approval by California State Lands Commission (CSLC). CSLC may also consult with California Department of Fish and Wildlife (CDFW) staff, California Coastal Commission staff, and other applicable agency staffs in considering the Sensitive Marine Species Monitoring and BMPs. The Plan shall include, at a minimum, the elements below. Poseidon shall write into the contract of each applicable contractor hired to conduct offshore work, including any required in-water pile driving, that all BMPs identified in the Plan shall be implemented. In-water construction activities shall not commence until the Plan has been approved. • The Plan shall identify the Exclusion/Shutdown and Behavioral Harassment (Impact) Zone for the marine mammals, sea turtles, and special-status marine bird species that may occur in the offshore construction area • The Plan shall identify measures that will be taken if marine mammals, sea turtles or special-status bird species are within the Impact Zone. These measures may include temporarily halting construction activities until the animal or bird has departed the Impact Zone, as described below. • The Plan shall list the equipment that marine wildlife monitors (MWMs) will have or be	intake and discharge pipelines	and Mitigation and BMP Implementation Plan	Monitoring and Mitigation and BMP Implementation Plan would reduce impacts to Special Status Species populations		construction begins

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	provided with to effectively monitor marine species (e.g., binoculars, radios or cell phones, log books). • Poseidon shall provide for approval by CSLC staff the names, qualifications, and roles of three or more MWMs. Selected MWMs shall be able to identify the types and behavior of the marine mammals, sea turtles, and special-status marine bird species that may occur in the offshore construction area. • Prior to the start of in-water work, MWMs shall be located where they have a clear view of marine waters in the Impact Zone and beyond. MWMs shall be on site and in radio or phone contact with offshore construction personnel at all times in-water construction is conducted. MWMs shall monitor the Impact Zone for 30 minutes before, during, and for 30 minutes after in-water construction activities, including any pile-driving. • At a minimum, MWMs shall collect the following information daily: (1) general location(s) of MWMs and marine wildlife observations; (2) date/time monitoring begins/ends; (3) activities occurring during each observation period; (4) weather parameters (e.g., percent cover, visibility) and conditions (e.g., sea state); (5) species observed and number of individuals; (6) description of any marine wildlife behavior patterns, including bearing and direction of travel and distance from pile driving activities; (7) other human activity in the					

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	area. MWMs shall keep a log book of notes about sightings of marine mammals, special-status birds or sea turtles. Entries in the log shall be made at least hourly, even if the entry is "None observed." Reports shall be emailed or faxed to CSLC staff daily. • Prior to the start of any pile-driving operations, if a marine mammal or sea turtle is sighted within or approaching the Impact Zone, MWMs shall notify the on-site construction lead (or other authorized individual) to delay pile driving until the animal has moved out of the Impact Zone or the animal has not been re-sighted within 15 minutes (for pinnipeds and small cetaceans) or 30 minutes (for large cetaceans). • If a marine mammal or sea turtle is sighted within or on a path toward the Impact Zone during any pile driving activities, pile driving shall cease until that animal has moved out of the Impact Zone or 15 minutes (pinnipeds and small cetaceans)/30 minutes (for large cetaceans) has lapsed since the last sighting. • MWMs shall have authority to temporarily halt in-water project activities if those activities pose a threat to individuals of a special-status species, and to suspend project activities until the animals have left the area. MWMs have the authority to direct cessation (or continuation) of construction activities based on adequate visibility, observed abundance of marine mammals and sea turtles, and their ability to view the Impact Zone. Periodic reevaluation of					

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	weather conditions and reassessment of the continuation/cessation recommendation shall be completed by the MWMs. • Within 30 days of the last day of each offshore work period that requires a MWM on the construction vessel, Poseidon shall submit to CSLC staff a Final Marine Wildlife Monitoring Report and copies of log books prepared by the approved MWMs that include at a minimum: • an evaluation of the effectiveness of monitoring protocols/procedures • reporting of all marine mammal, sea turtle, and other wildlife sightings (including species and numbers) • any wildlife behavioral changes that may be attributed to project construction • all project changes (e.g., delays, work stoppages, etc.) due to the presence in the area of marine wildlife species • Operators of vessels traveling to the construction site shall maintain a minimum distance of 1,000 feet from whales and sea turtles. Vessels shall not cross directly in front of whales or sea turtles. When paralleling whales, vessels shall operate at a constant speed that is not faster than the whales at a distance less than 1,000 feet. If the whale exhibits evasive, defensive or other adverse behaviors, the vessel shall decrease speed and change direction and increase distance from the whale until the distance is sufficient to reduce stress displayed by the whale. • Any collisions with marine wildlife shall be					

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	reported promptly to CSLC and wildlife agency (National Marine Fisheries Service, CDFW) staffs pursuant to each agency's reporting procedures. • All daily vessel trips used for construction and maintenance activities will originate from local ports. • Divers shall not attempt to interact with any marine mammals or sea turtles.					
	APM-6. Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map. At least 30 days, but not more than 60 days, before the start of offshore construction, Poseidon shall submit an Anchoring, Riprap Reconfiguration, and Dredging Plan for review and approval by California State Lands Commission (CSLC) staff. CSLC staff may also consult with Coastal Commission staff, in considering the Anchoring, Riprap Reconfiguration and Dredging Plan. The Plan shall ensure that impacts on benthic environments are minimized during installation of the wedgewire screens and diffuser, as well as maintenance buoys if required, riprap reconfiguration, and dredging. This Plan shall identify and map Preclusion Areas—all areas of kelp, seagrasses, and hard substrate found within the work area—that shall not be impacted by placement of vessel and buoy anchors, by dragging anchor or buoy lines or cables, by riprap placement, or by dredging spoils during Lease Modification Project construction and maintenance activities. Any surveys subject to the CSLC's Low-Energy	HB Generating Station intake and discharge pipelines	Approval of an Anchoring, Riprap Reconfiguration, and Dredging Plan, an "as-built" map, and disturbance procedures by CSLC staff	Implementing the Anchoring, Riprap Reconfiguration, and Dredging Plan would minimize impacts to Special Status Species populations in benthic environments.	CSLC	At least 30 days, but not more than 60 days prior to starting project construction activities for the Plan and within 30 days after completion of construction for the map and procedures

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	Offshore Geophysical Permit Program shall be conducted by CSLC-permitted operators. Within 30 days after completion of offshore construction, Poseidon shall submit to CSLC staff for approval: (1) an "as-built" map overlaying the Preclusion Area Map with Global Positioning System coordinates showing all areas of direct disturbance, anchor and buoy locations, and riprap boundaries, and (2) the procedures Poseidon shall implement to remedy any disturbance that may have occurred within the Preclusion Area due to Poseidon's construction activities.					
Impact OWQ/MB-3: Impact to Special Status Species Populations and Movement of Marine Mammal Species as a Result of Underwater Noise during Construction	**APM-5**: see Impact OWQ/MB-2 above	HB Generating Station intake and discharge pipelines	Approval of a Sensitive Marine Species Monitoring and Mitigation and BMP Implementation Plan	Implementing a Sensitive Marine Species Monitoring and Mitigation and BMP Implementation Plan would reduce impacts to Special Status Species and marine mammal species populations	CSLC	At least 30 days before offshore construction begins
	New to this Supplemental EIR: **MM OWQ/MB-3a: Vibratory Pile Driving** Installation of the 12-inch steel H-piles for the wedgewire screens shall use a vibratory hammer to reduce the peak noise levels. If site-specific geotechnical studies show that vibratory pile driving cannot be used and impact pile driving is required, Poseidon shall	HB Generating Station intake and discharge pipelines	Project monitor confirms that a vibratory hammer is used during installation of the H-piles or approval of impact pile driving use by	Implementing MM reduces peak noise level impacts to Special Status Species populations	CSLC	During construction activities

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	obtain California State Lands Commission ~~staff~~ approval for the use of impact pile driving.		CSLC staff			
	New to this Supplemental EIR: **MM OWQ/MB-3b: Pile Driving Work Windows** Pile driving shall only occur between June and November to avoid potential impacts to gray whale migrations in this region. The California State Lands Commission Executive Officer or designee, following consultation with California Coastal Commission and California Department of Fish and Wildlife staffs, may adjust the work window based on changes made during National Marine Fisheries Service (NMFS) consultation. In-water pile driving shall not occur between 30 minutes before sunset and 30 minutes after sunrise.	HB Generating Station intake and discharge pipelines	Project monitor confirms that pile driving occurs only between July and November	Implementing MM avoids impacts to gray whale migration	CSLC	Between June and November
	New to this Supplemental EIR: **MM OWQ/MB-3c: Soft Start** A soft start for pile driving requires contractors to initiate the driver at a reduced energy for 15 seconds followed by a 30-second waiting period; this procedure is then repeated two additional times. A soft start shall be implemented before pile driving begins each day and any time following the cessation of pile driving for 30 minutes or longer.	HB Generating Station intake and discharge pipelines	Project monitor confirms that a soft start for pile driving is implemented	Implementing MM avoids impacts to marine mammals	CSLC	During construction
Impact OWQ/MB-4: Spread of Invasive and Non-Native Marine Species	**New to this Supplemental EIR:** **MM OWQ/MB-4: Prevent Introduction of Invasive Non-Native Species.** All Lease Modification Project barges and tugs shall: (1) originate from the Ports of Long Beach/Los Angeles (POLB/POLA); (2) be	HB Generating Station intake and discharge pipelines	Project monitor confirms that barges and tugs originate from or continuously be based out of POLB	Implementing MM prevents introduction of invasive non-native species	CSLC	During construction activities

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
in the Ocean	continuously based out of POLB/POLA since last dry docking; or (3) have underwater surfaces cleaned before entering southern California at vessel origination point and immediately prior to transiting to the Lease Modification Project site. Additionally, and regardless of vessel size, ballast water for all Lease Modification Project vessels must be managed consistent with California State Lands Commission (CSLC) ballast manage-ment regulations, and Biofouling Removal and Hull Husbandry Reporting Forms shall be submitted to CSLC staff. Lease Modification Project vessels shall also be available for inspection by CSLC staff for compliance.		or have underwater surfaces cleaned and Biofouling Removal and Hull Husbandry Reporting Forms are submitted to CSLC staff			
Impact OWQ/MB-5: Impact to Ocean Water Quality from Wedgewire Screen and Diffuser Operation and Maintenance	**APM-1**: see above Impact OWQ/MB-1 above	HB Generating Station intake and discharge pipelines	Approval of BMPs by CSLC staff and project monitor to confirm that the offshore construction contractor implements the BMPs	Implementing the BMPs would reduce impacts to water quality from wedgewire screen and diffuser operation and maintenance	CSLC	During construction activities
	APM-2: see above Impact OWQ/MB-1 above	HB Generating Station intake and discharge pipelines	Approval of a Turbidity Minimization and Monitoring Plan by CSLC staff	Implementing a Turbidity Minimization and Monitoring Plan would reduce impacts to water quality from Wedgewire Screen and Diffuser Operation and	CSLC	At least 30 days before offshore construction begins

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
				Maintenance		
	New to this Supplemental EIR: **APM-8**: **Composition and Maintenance of Wedgewire Screens.** Poseidon shall install stationary wedgewire screens with a slot width of 1 mm and a through velocity of 0.5 feet/second or less (per Ocean Plan Section III.M.2.d(1)(c) requirements) at the existing HBGS intake pipeline riser prior to desalination plant commercial operation. The composition of the screens shall be stainless steel, unless Poseidon demonstrates to the satisfaction of California State Lands Commission staff that the use of copper nickel alloy screens would not result in chemical leaching in excess of Ocean Plan Water Quality Objectives for Protection of Marine Life standards. Such demonstration must be based on data that have been reviewed and approved by the State and Regional Water Boards' staff and California Coastal Commission staff. The screens shall be maintained through boat-based air-burst wedgewire screen cleaning methods.	HB Generating Station intake pipeline	CSLC staff/project monitor confirm stainless screen screen installation	Screens kept maintained through boat-based air-burst wedgewire screen cleaning methods	CSLC	Prior to installation. Notification of cleaning intervals.
Impact OWQ/MB-~~5~~6: Impact to Special Status Species Populations of Intake Flow Reduction (Compared to 2010 Project)	**APM-1**: see above Impact OWQ/MB-1 above	HB Generating Station intake and discharge pipelines	Approval of BMPs by CSLC staff and project monitor to confirm that the offshore construction contractor implements the BMPs	Implementing the BMPs would reduce impacts to ~~to~~ Special Status Species populations	CSLC	During construction activities
	APM-2: see above Impact OWQ/MB-1 above	HB	Approval of a	Implementing a	CSLC	At least 30

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
and Use and Maintenance of Wedgewire Screens		Generating Station intake and discharge pipelines	Turbidity Minimization and Monitoring Plan by CSLC staff	Turbidity Minimization and Monitoring Plan would reduce impacts to Special Status Species populations		days before offshore construction begins
	APM-4: see above Impact OWQ/MB-1 above	HB Generating Station intake and discharge pipelines	Approval of a qualified biologist to prepare a worker education training program	Implementing a worker education program would reduce impacts to Special Status Species populations during construction and maintenance activities	CSLC	During construction activities
	APM-5: see above Impact OWQ/MB-2 above	HB Generating Station intake and discharge pipelines	Approval of a Sensitive Marine Species Monitoring and Mitigation and BMP Implementation Plan	Implementing a Sensitive Marine Species Monitoring and Mitigation and BMP Implementation Plan would reduce impacts to Special Status Species populations	CSLC	At least 30 days before offshore construction begins
	APM-6: see above Impact OWQ/MB-2 above	HB Generating Station	Approval of an Anchoring, Riprap Reconfiguration,	Implementing the Anchoring, Riprap	CSLC	At least 30 days, but not more than 60

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
		intake and discharge pipelines	and Dredging Plan, an "as-built" map, and disturbance procedures by CSLC staff	Reconfiguration, and Dredging Plan would minimize impacts to Special Status Species populations		days prior to starting project construction activities for the Plan and within 30 days after completion of construction for the map and procedures
Impact OWQ/MB-7: Impact to Special Status Species Populations of Diffuser Operation.	**New to this Supplemental EIR:** **MM OWQ/MB-7. Develop and Implement A Diffuser-Operation Marine Life Mitigation Plan**. At least 6 months prior to installation of the discharge diffuser for the proposed Huntington Beach Desalination Plant, Poseidon shall submit to the California State Lands Commission (CSLC) staff for approval a Diffuser-Operation Marine Life Mitigation Plan (DOMLMP), to be part of the Marine Life Mitigation Plan required under the Desalination Amendment, as compensatory mitigation in an amount that is roughly proportional to the marine life impacts associated with diffuser entrainment. Poseidon shall submit the DOMLMP concurrently to Santa Ana Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), and California Coastal Commission (CCC) staffs to facilitate interagency consultation and Plan development. Poseidon shall subsequently	HB Generating Station intake and discharge pipelines	Approval of a DOMLMP by CSLC staff and Project monitor confirms implementation of the DOMLMP	Implementation of the DOMLMP would reduce impacts to Special Status Species populations from diffuser operation	CSLC	At least 6 months prior to installation of the discharge diffuser

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	implement the DOMLMP upon approval by the CSLC staff, in consultation with the ~~Santa Ana Regional Water Quality Control Board (~~RWQCB~~)~~, ~~California Department of Fish and Wildlife (~~CDFW~~)~~, and ~~California Coastal Commission (~~CCC~~)~~ staffs. The Plan shall cover at a minimum the following details. • The DOMLMP shall provide for the restoration of ~~no less than 22.81~~ 99 acres, for co-located operations which is based on the replacement of the area of fish production lost (i.e., Area of Production Foregone [APF]) as a result of adding a diffuser to the discharge pipeline minus any benefits provided by reducing intake flow and adding wedgewire screens approved as part of the 2010 Project. ~~If the APF is determined to be less, the DOMLMP will still provide 22.81 acres of restoration.~~ • If no co-located operations occur (stand-alone operation only), the amount of restoration acreage may be reduced to ~~21.5~~ 95.9 acres ~~but no less~~. • The DOMLMP shall define the site or project selection process and objectives. It shall define the commitment of long-term funding for restoration and ongoing operation, maintenance, monitoring, and management of an appropriate wetlands site in Orange County for the life of desalination operations. The site or sites selected must provide restored habitat that can operate at a similar level of productivity to comparable natural habitat for the life of desalination operations. Sites or projects to be considered may					

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	include Bolsa Chica Lowlands Restoration Project, Huntington Beach Wetlands, Big Canyon Creek, or other site in Orange County that is approved by the CSLC Executive Officer, in consultation with the RWQCB, CDFW, and CCC staffs.					
4.2 AESTHETICS/LIGHT & GLARE						
Impact ALG-2: Creation of New Sources of Substantial Light or Glare such as Nighttime Illumination	**[Deleted as MM applies to onshore only]** ~~**From 2010 FSEIR:**~~ ~~**MM ALG-2: Lighting Plan.**~~	~~HB Desalination Plant~~	~~Approval of the Lighting Plan~~	~~Implementing MM would reduce light intensity and light spillage from new light sources onshore.~~	~~CSLC~~	~~Prior to starting project construction activities~~
	New to this Supplemental EIR: **MM ALG-2a: Lighting Plan (Offshore Waters).** The Applicant shall add an addendum to the Huntington Beach Desalination Plant lighting plan to specify that outdoor light intensity on construction barges anchored or moored overnight at the offshore Lease Modification Project site shall be limited to nautical lights necessary for vessel safety and that barge security lighting shall be shielded ~~where feasible~~ or directed downwards.	HB Generating Station intake and discharge pipelines	Approval of the Lighting Plan	Implementing MM would reduce light intensity and light spillage from new light sources offshore.	CSLC	Prior to starting project construction activities

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
4.3 AIR QUALITY						
Impact AQ-1: Air Emissions from Construction	~~**From 2010 FSEIR**~~ **New to this Supplemental EIR:** **MM CON-14a: Diesel Fuel Reduction Plan (Offshore Waters).** Poseidon shall add an addendum to the Huntington Beach Desalination Plant "Diesel Fuel Reduction Plan" (included as a condition in Lease PRC 1980.1) to identify the actions to be taken to reduce diesel fuel emissions during offshore construction activities. The addendum, which shall be submitted to California State Lands Commission staff for review and approval, shall include at a minimum the following measures related to use of diesel powered equipment: • Use diesel powered equipment meeting Tier 2 4 CARB/U.S. EPA or higher emissions standards to the maximum extent feasible; if not already supplied with a factory-equipped diesel particulate filter, all off-road diesel-powered construction equipment shall be outfitted with BACT devices certified by CARB • Use 2010 model year diesel haul trucks or newer for material delivery and soil import/export activities • Use marine vessel engines that are model year 2009 or newer, and thus compliant with Tier 3 marine compression-ignition standards • Use portable construction equipment registered with the State's portable equipment registration program	HB Generating Station intake and discharge pipelines	Approval of the Diesel Fuel Reduction Plan by the City Engineer	Implementing a Diesel Fuel Reduction Plan measures would reduce emissions from construction activities.	CSLC and City of Huntington Beach	Prior to starting project construction activities

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	• Use low sulfur diesel fuel and minimize idle time • Ensure all heavy duty diesel powered vehicles comply with state and federal standards applicable at time of purchase • Use diesel oxidation catalyst and catalyzed diesel particulate filters or other approved emission reduction retrofit devices installed on applicable construction equipment used during individual projects • Consider other measures such as incentives and/or phase-in schedules for clean trucks during the construction period to ensure that equipment achieves the lowest emissions commercially available at the time of construction					
	New to this Supplemental EIR: **MM CON-14b: Internal Combustion Engine Emissions Reduction Plan (Offshore Waters).** ~~Prior to~~ At least 120 days before the start of construction, Poseidon shall submit to California State Lands Commission staff an Internal Combustion Engine Emissions Reduction Plan that contains, at a minimum the following measures: • ~~Where feasible, use~~Use equipment powered by sources that have lowest emissions commercially available at the time of construction, or equipment powered by electricity if such equipment is commercially available at the time of construction • Use equipment with smallest engine size commercially available and capable of completing project goals to reduce overall	HB Generating Station intake and discharge pipelines	Submittal of an Internal Combustion Engine Emissions Reduction Plan by CSLC staff	Implementing an Internal Combustion Engine Emissions Reduction Plan would reduce emissions from construction activities.	CSLC	Prior to starting project construction activities

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	emissions • Minimize idling time and unnecessary operation of internal combustion engine powered equipment					
Impact CMLTV-AQ-1: Cumulative Air Emissions from Construction	**MM CON-14a**: see Impact AQ-1 above	HB Generating Station intake and discharge pipelines	Approval of the Diesel Fuel Reduction Plan by the City Engineer	Implementing a Diesel Fuel Reduction Plan measures would reduce cumulative emissions from construction activities.	CSLC	Prior to starting project construction activities
	MM CON-14b: see Impact AQ-1 above	HB Generating Station intake and discharge pipelines	Submittal of an Internal Combustion Engine Emissions Reduction Plan by CSLC staff	Implementing an Internal Combustion Engine Emissions Reduction Plan would reduce emissions from construction activities.	CSLC	Prior to starting project construction activities
4.4 CULTURAL RESOURCES						
Impact CUL-1: Change in Significance of Previously Recorded Historical or Unique Archaeological Resources	**APM-6**. see Impact OWQ/MB-2 above	HB Generating Station intake and discharge pipelines	Approval of an Anchoring, Riprap Reconfiguration, and Dredging Plan, an "as-built" map, and disturbance procedures by CSLC staff	Implementing the Anchoring, Riprap Reconfiguration, and Dredging Plan would minimize impacts to previously recorded	CSLC	At least 30 days, but not more than 60 days prior to starting project construction activities for the Plan and within 30 days

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
				historical or archaeological resources in benthic environments.		after completion of construction for the map and procedures
Impact CUL-2: Change in Significance of Previously Unidentified Historical or Unique Archaeological Resources	**APM-6**. see Impact OWQ/MB-2 above	HB Generating Station intake and discharge pipelines	Approval of an Anchoring, Riprap Reconfiguration, and Dredging Plan, an "as-built" map, and disturbance procedures by CSLC staff	Implementing the Anchoring, Riprap Reconfiguration, and Dredging Plan would minimize impacts to previously unidentified historical or archaeological resources in benthic environments.	CSLC	At least 30 days, but not more than 60 days prior to starting project construction activities for the Plan and within 30 days after completion of construction for the map and procedures
	[Deleted as MM applies to onshore only] **~~From 2010 FSEIR:~~** ~~MM CON49: Buried Historical/ Archaeological Resources.~~	~~HB Generating Station intake and discharge pipelines~~	~~Project monitor confirms all construction work in that area is halted/diverted~~	~~Implementing MM would reduce impacts to buried historical or archaeological resources.~~	~~CSLC~~	~~Immediately following discovery of a historical or archaeological resource during excavation~~
	New to this Supplemental EIR: **MM CUL/TCR-2a: Cultural Resource Identification during Geophysical Surveys.** Poseidon shall ensure that a qualified	HB Generating Station intake and	Approval of a qualified maritime archaeologist by CSLC staff and	Implementing MM would reduce impacts to previously	CSLC	Prior to starting construction

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	maritime archaeologist (e.g., one who meets Secretary of the Interior Professional Qualifications Standards defined in Code of Federal Regulations, section 36, part 61), approved by California State Lands Commission (CSLC) staff, participates in the development and implementation of the geophysical surveys conducted to develop the Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map. The archaeologist shall identify any cultural resources found during the surveys, and prepare a summary report to be submitted to CSLC staff.	discharge pipelines	submittal of a summary report or surveys to CSLC staff	unidentified historical or archaeological resources		
	New to this Supplemental EIR: **MM CUL/TCR-2b: Discovery of Previously Unidentified Cultural or Tribal Cultural Resources.** If potentially significant archaeological or Tribal cultural resources are discovered any time during the Lease Modification Project geophysical surveys, construction, and operation activities, work within 250 feet of the find shall be temporarily suspended or redirected away from the discovery until the Applicant has notified California State Lands Commission (CSLC) staff and any local, State, or Federal agency with approval or permitting authority over the Lease Modification Project that has requested/required notification. Notification shall occur within 48 hours of discovery and be consistent with guidelines for Tribal involvement as stated in the CSLC Tribal Policy (www.slc.ca.gov/About/Tribal.html).	HB Generating Station intake and discharge pipelines	Project monitor confirms that work within 250 feet of the find is temporarily suspended or redirected away from the discovery and the Applicant retains a CSLC-approved archaeologist and requests evaluation of the discovery from a culturally affiliated Tribal representative	Implementing MM would reduce impacts to previously unidentified cultural or tribal cultural resources	CSLC	Immediately following discovery of an archaeological or tribal cultural resource during geophysical surveys or construction or operation activities

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	The Applicant shall retain a CSLC-approved archaeologist and request a culturally affiliated Tribal representative to evaluate the nature and significance of the discovery. In addition, the following shall apply: • Impacts to previously unknown significant archaeological or Tribal cultural resources shall be avoided through preservation in place if feasible. • Damaging effects to Tribal cultural resources shall be avoided or minimized following the measures identified in Public Resources Code section 21084.3, subdivision (b), unless other measures are mutually agreed to by the lead archaeologist and culturally affiliated Tribal representative that would be as or more effective. • If Tribal cultural resources cannot be avoided, a Treatment Plan developed by the archaeologist and the culturally affiliated Tribal representative, shall be submitted to CSLC staff for review and approval prior to further disturbance of the area. The plan shall: • state requirements for professional qualifications of all cultural resources specialists and Tribal cultural resource workers • identify appropriate methods of resource recording, artifact cataloguing, and analyses • determine appropriate levels of recovery and/or stabilization of resources • provide documentation of a curatorial facility or museum that will be responsible for the permanent preservation of any unique or					

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	sensitive cultural materials resulting from site recovery and/or stabilization efforts • If the lead archaeologist and the culturally affiliated Tribal representative believe that damaging effects to archaeological or Tribal cultural resources will be avoided or minimized, then work in the area may resume.					
Impact CUL-3: Construction or operation of the Project could damage or destroy paleontological resources.	**APM-6**: see Impact OWQ/MB-2 above	HB Generating Station intake and discharge pipelines	Approval of an Anchoring, Riprap Reconfiguration, and Dredging Plan, an "as-built" map, and disturbance procedures by CSLC staff	Implementing the Anchoring, Riprap Reconfiguration, and Dredging Plan would minimize impacts to paleontological resources in benthic environments.	CSLC	At least 30 days, but not more than 60 days prior to starting project construction activities for the Plan and within 30 days after completion of construction for the map and procedures
	[Deleted as MM applies to onshore only] ~~**From 2010 FSEIR:**~~ ~~MM CON-50: Paleontological Resource Recovery Program.~~	~~HB Desalination Plant~~	~~Preparation of a paleontological resource recovery program for Miocene invertebrate fossils~~	~~Implementing the Paleontological Resource Recovery Program would reduce impacts to paleontological resources~~	~~CSLC~~	~~During construction activities~~

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	[Deleted as MM applies to onshore only] ~~**From 2010 FSEIR:**~~ ~~MM CON-51: Qualified Paleontologist.~~	~~HB Desalination Plant~~	~~Project monitor confirms that a qualified paleontologist is retained to monitor grading operations~~	~~Implementing MM would reduce impacts to paleontological resources~~	~~CSLC~~	~~During construction activities~~
Impact CUL-4: Disturb Unidentified Human Remains	**[Deleted as MM applies to onshore only]** ~~**From 2010 FSEIR:**~~ ~~MM CON-52: Discovery of Human Remains during Excavation.~~	~~HB Desalination Plant~~	~~Project monitor confirms no further excavation or disturbance of the site or nearby area and that a County coroner is notified~~	~~Implementing MM would reduce impacts to discovered human remains~~	~~CSLC~~	~~Immediately following discovery of human remains during construction activities and within two working days for notification~~
	New to this Supplemental EIR: **MM CUL-4/TCR-4: Appropriate Treatment of Human Remains.** In accordance with Health and Safety Code section 7050.5 and Public Resources Code section 5097.98, if human remains are found, all ground disturbing activities shall halt within 165 feet (50 meters) of the discovery. The Applicant must contact the County Coroner and California State Lands Commission (CSLC) staff within 24 hours of the discovery. No further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie potential remains shall occur until the County Coroner has determined whether the remains are subject to his or her authority. The County Coroner must make this determination within 2 working	HB Generating Station intake and discharge pipelines	Project monitor confirms that all ground disturbing activities ceases within 165 feet (50 meters) of discovery of human remains and that the County coroner and CSLC are notified	Implementing MM would reduce impacts to discovered human remains	CSLC	Immediately following discovery of human remains during construction activities and within 24 hours for notification

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	days of notification of the discovery pursuant to Health and Safety Code section 7050.5 subdivision (b). If the County Coroner determines that the remains do not require an assessment of cause of death and that the remains are, or are believed to be Native American, the Coroner must notify the Native American Heritage Commission (NAHC) by telephone within 24 hours. In accordance with Public Resources Code section 5097.98, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) of the deceased Native American. The MLD shall complete their inspection and make recommendations within 48 hours of being granted access to the site. The MLD may recommend means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. CSLC staff will discuss and confer with the MLD regarding their recommendations pursuant to Public Resources Code section 5097.98 subdivision (b) and (c)					
4.5 CULTURAL RESOURCES – TRIBAL						
Impact TCR-2: Change in Significance of Previously Unidentified Tribal Cultural Resources	**APM-6**: see Impact OWQ/MB-2 above	HB Generating Station intake and discharge pipelines	Approval of an Anchoring, Riprap Reconfiguration, and Dredging Plan, an “as-built” map, and disturbance procedures by CSLC staff	Implementing the Anchoring, Riprap Reconfiguration, and Dredging Plan would minimize impacts to previously unidentified tribal cultural	CSLC	At least 30 days, but not more than 60 days prior to starting project construction activities for the Plan and within 30 days after

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
				resources in benthic environments.		completion of construction for the map and procedures
	[Deleted as MM applies to onshore only] ~~**From 2010 FSEIR:**~~ ~~MM CON-52: (Discovery of Human Remains during Excavation).~~	~~HB Desalination Plant~~	~~Project monitor confirms no further excavation or disturbance of the site or nearby area and that a County coroner is notified~~	~~Implementing MM would reduce impacts to discovered human remains~~	~~CSLC~~	~~Immediately following discovery of human remains during construction activities and within two working days for notification~~
	New to this Supplemental EIR: **MM CUL/TCR-2a: Cultural Resource Identification during Geophysical Surveys.** Poseidon shall ensure that a qualified maritime archaeologist (e.g., one who meets Secretary of the Interior Professional Qualifications Standards defined in Code of Federal Regulations, section 36, part 61), approved by California State Lands Commission (CSLC) staff, participates in the development and implementation of the geophysical surveys conducted to develop the Anchoring, Riprap Reconfiguration, and Dredging Plan and Preclusion Area Map. The archaeologist shall identify any cultural resources found during the surveys, and prepare a summary report to be submitted to CSLC staff.	HB Generating Station intake and discharge pipelines	Approval of a qualified maritime archaeologist by CSLC staff and submittal of a summary report or surveys to CSLC staff	Implementing MM would reduce impacts to previously unidentified tribal cultural resources	CSLC	Prior to starting construction

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	<u>New to this Supplemental EIR:</u> **MM CUL/TCR-2b: Discovery of Previously Unidentified Cultural or Tribal Cultural Resources.** If potentially significant archaeological or Tribal cultural resources are discovered any time during the Lease Modification Project geophysical surveys, construction, and operation activities, work within 250 feet of the find shall be temporarily suspended or redirected away from the discovery until the Applicant has notified California State Lands Commission (CSLC) staff and any local, State, or Federal agency with approval or permitting authority over the Lease Modification Project that has requested/required notification. Notification shall occur within 48 hours of discovery and be consistent with guidelines for Tribal involvement as stated in the CSLC Tribal Policy (www.slc.ca.gov/About/Tribal.html). The Applicant shall retain a CSLC-approved archaeologist and request a culturally affiliated Tribal representative to evaluate the nature and significance of the discovery. In addition, the following shall apply: • Impacts to previously unknown significant archaeological or Tribal cultural resources shall be avoided through preservation in place if feasible. • Damaging effects to Tribal cultural resources shall be avoided or minimized following the measures identified in Public Resources Code section 21084.3, subdivision (b), unless other measures are mutually agreed	HB Generating Station intake and discharge pipelines	Project monitor confirms that work within 250 feet of the find is temporarily suspended or redirected away from the discovery and the Applicant retains a CSLC-approved archaeologist and requests evaluation of the discovery from a culturally affiliated Tribal representative	Implementing MM would reduce impacts to previously unidentified tribal cultural resources	CSLC	Immediately following discovery of an archaeological or tribal cultural resource during geophysical surveys or construction or operation activities

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	to by the lead archaeologist and culturally affiliated Tribal representative that would be as or more effective. • If Tribal cultural resources cannot be avoided, a Treatment Plan developed by the archaeologist and the culturally affiliated Tribal representative, shall be submitted to CSLC staff for review and approval prior to further disturbance of the area. The plan shall: • state requirements for professional qualifications of all cultural resources specialists and Tribal cultural resource workers • identify appropriate methods of resource recording, artifact cataloguing, and analyses • determine appropriate levels of recovery and/or stabilization of resources • provide documentation of a curatorial facility or museum that will be responsible for the permanent preservation of any unique or sensitive cultural materials resulting from site recovery and/or stabilization efforts • If the lead archaeologist and the culturally affiliated Tribal representative believe that damaging effects to archaeological or Tribal cultural resources will be avoided or minimized, then work in the area may resume.					
	<u>New to this Supplemental EIR:</u> **MM CUL-4/TCR-4: Appropriate Treatment of Human Remains.** In accordance with Health and Safety Code section 7050.5 and Public Resources Code section 5097.98, if human remains are found,	HB Generating Station intake and discharge pipelines	Project monitor confirms that all ground disturbing activities ceases within 165 feet (50 meters) of	Implementing MM would reduce impacts to discovered human remains	CSLC	Immediately following discovery of human remains during

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	all ground disturbing activities shall halt within 165 feet (50 meters) of the discovery. The Applicant must contact the County Coroner and California State Lands Commission (CSLC) staff within 24 hours of the discovery. No further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie potential remains shall occur until the County Coroner has determined whether the remains are subject to his or her authority. The County Coroner must make this determination within 2 working days of notification of the discovery pursuant to Health and Safety Code section 7050.5 subdivision (b). If the County Coroner determines that the remains do not require an assessment of cause of death and that the remains are, or are believed to be Native American, the Coroner must notify the Native American Heritage Commission (NAHC) by telephone within 24 hours. In accordance with Public Resources Code section 5097.98, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) of the deceased Native American. The MLD shall complete their inspection and make recommendations within 48 hours of being granted access to the site. The MLD may recommend means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. CSLC staff will discuss and confer with the MLD regarding their recommendations pursuant to Public Resources Code section 5097.98 subdivision (b) and (c)		discovery of human remains and that the County coroner and CSLC are notified			construction activities and within 24 hours for notification

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
4.6 GREENHOUSE GAS EMISSIONS						
Impact GHG-1: GHG Emissions from Project Activities	**APM 7**. An *Energy Minimization and Greenhouse Gas Reduction Plan*, most recently updated February 27, 2017, shall be implemented to offset the total direct and indirect GHG emissions from construction and operations of the HB Desalination Plant	HB Desalination Plant	Project monitor confirms that an *Energy Minimization and Greenhouse Gas Reduction Plan* is implemented	Implementing an *Energy Minimization and Greenhouse Gas Reduction Plan* would offset GHG emissions from project construction and operation	CSLC	During construction and operation activities
4.7 HAZARDS AND HAZARDOUS MATERIALS						
Impact HAZ-2: Release of Hazardous Materials through Reasonably Foreseeable Upset and Accident Conditions	**APM-3**: see Impact OWQ/MB-1 above	HB Generating Station intake and discharge pipelines	Approval of a Spill Prevention and Response Plan by CSLC staff	Implementing a Spill Prevention and Response Plan would reduce impacts from any potential release of hazardous materials	CSLC	At least 60 days before offshore construction begins
	New to this Supplemental EIR: **MM HAZ-1: Prepare for Inclement Weather Condition.** Poseidon shall tie-down or provide secondary containment for any deck equipment that may discharge contaminants to minimize the potential for unanticipated release of pollutants due to inclement weather or rough sea conditions. In addition, Poseidon shall monitor weather conditions and tsunami warnings, and cease work if determined that existing or forecast sea states or weather conditions would create unsafe working	HB Generating Station intake and discharge pipelines	Project monitor confirms that any deck equipment that may discharge contaminants are tied-down or have been provided secondary containment; Approval by the CSLC of a plan to monitor weather conditions and	The potential for unanticipated release of pollutants due to inclement weather or rough sea conditions would be reduced.	CSLC	Prior to and during project construction activities

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
	conditions for personnel or equipment.		tsunami warnings			
4.8 NOISE AND VIBRATION						
Impact NOI-1: Construction and Operation Impacts in Excess of Applicable Community Noise Standards	**From 2010 FSEIR:** **MM CON-15: Construction and Noise Reduction.**	HB Generating Station intake and discharge pipelines	Review and approval of evidence of noise reduction by City of Huntington Beach Planning and Building Department and Public Works Department.	Reduction in construction noise to appropriate levels as allowed in the City's Municipal Code.	CSLC	Prior to starting project construction activities
	From 2010 FSEIR: **MM NOI-1: Outdoor Pump Noise Reduction.**	HB Generating Station intake and discharge pipelines	Project monitor confirms that all pumps located outdoors are located within enclosed structures with adequate setback and screening.	Reduction in outdoor pump noise to City's Noise Ordinance levels measured at nearby residence property lines	CSLC	During construction activities
Impact NOI-3: Construction Noise Impacts in Excess of Ambient Noise Levels	**From 2010 FSEIR:** **MM CON-15: Construction and Noise Reduction.**	HB Generating Station intake and discharge pipelines	Review and approval of evidence of noise reduction by City of Huntington Beach Planning and Building Department and Public Works Department.	Reduction in construction noise to appropriate levels as allowed in the City's Municipal Code.	CSLC	Prior to starting project construction activities
4.9 RECREATION						
Impact TRM-1:	**MM TRM-1**: see Impact TRM-1 below	Transit to	Project monitor	Collisions of	CSLC	Prior to and

Table 7-1. Mitigation Monitoring Program

Impact (Class)	Mitigation Measure (MMs) / Applicant Proposed Measures (APMs)	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Entity	Timing
Marine Vessel Safety		and from Port of Long Beach and on station at HB Generating Station intake and discharge pipelines	confirms that Local Notice to Mariners is published	vessels during transit and while on station		during construction activities
4.10 TRANSPORTATION						
Impact TRM-1: Marine Vessel Safety	**New to this Supplemental EIR:** **MM TRM-1: ~~MM TRM-1.~~ Publication of U.S. Coast Guard (USCG) Local Notice to Mariners.** The Applicant shall ensure that its contractor submits to the USCG District 11 (as stated at www.uscg.mil/D11/DP/LnmRequest.asp), a request to publish a Local Notice to Mariners, 14 days prior to operation, that includes the following information: • Type of operation (i.e., dredging, diving operations, construction) • Location of operation including Latitude and Longitude and geographical position if applicable • Duration of operation including start and completion dates (if these dates change, the Coast Guard needs to be notified) • Vessels involved in the operation • VHF-FM Radio Frequencies monitored by vessels on scene • Point of Contact and 24-hour phone number • Chart Number for the area of the operation	Transit to and from Port of Long Beach and on station at HB Generating Station intake and discharge pipelines	Project monitor confirms that Local Notice to Mariners is published	Collisions of vessels during transit and while on station	CSLC	Prior to and during construction activities

Page Intentionally Left Blank

8.0 OTHER COMMISSION CONSIDERATIONS

In addition to the environmental review required pursuant to the California Environmental Quality Act (CEQA), a public agency may consider other information and policies in its decision-making process. This section presents information relevant to the consideration by the California State Lands Commission (CSLC) of the application by Poseidon Resources (Surfside) LLC (Poseidon) for a lease amendment for the proposed modifications to Lease PRC 1980.1 (hereinafter referred to Lease Modification Project). The considerations included below address:

- Climate Change and Sea-Level Rise
- Environmental Justice

Other considerations may be addressed in the staff report presented at the time of the CSLC's consideration of the lease amendment.

8.1 CLIMATE CHANGE AND SEA-LEVEL RISE CONSIDERATIONS

Climate change impacts, including sea-level rise, are now recognized as known geophysical components of California coastal and ocean sites. Climate change and sea-level rise accelerate and exacerbate natural coastal processes, such as intensity and frequency of storms, erosion and sediment transport, and currents, wave action, and ocean chemistry. Sea-level rise is driven by the melting of polar ice caps and land ice, as well as thermal expansion of sea water. Accelerating rates of sea-level rise are attributed to increasing global temperatures due to climate change. Estimates of projected sea-level rise vary regionally and are a function of different greenhouse gas emissions scenarios, rates of ice melt, and local vertical land movement. Compared to year 2000 levels, the southern California region could see up to 1 foot of sea-level rise by the year 2030, 2 feet by 2050, and possibly over 5 feet by 2100 (National Research Council 2012). The range in potential sea-level rise indicates the complexity and uncertainty of projecting these future changes, particularly in the second half of the century, that depend on the rate and extent of ice melt. The state of California is coordinating research efforts to understand more about the individual influences of certain contributing factors, such as ice melt, and will issue findings and new planning guidance related to sea-level rise by 2018.

The City's Sea-Level Rise Vulnerability Assessment (2014) identifies assets that are vulnerable to coastal flooding and inundation within the City's designated Huntington Beach "planning area," which would include the HB Desalination Plant. Industrial buildings in the planning area are at high risk of impacts from sea-level rise due to their high sensitivity and low adaptive capacity. Local subsidence, coupled with sea-level rise, will contribute to higher total water levels. Land subsidence in Huntington Beach is linked to historic oil extraction. During the previous century, approximately 0.8 feet of

subsidence occurred in the area directly north of the HB Desalination Plant, at the Huntington Bluffs.

Along with higher sea levels, higher intensity and more frequent precipitation events due to climate change will further impact coastal areas (Tebaldi 2012). The combination of these conditions will likely result in increased wave run up, storm surge, and flooding in coastal and near coastal areas. In rivers and tidally-influenced waterways, more frequent and powerful storms can result in increased flooding conditions and damage from storm created debris. Climate change and sea-level rise will also affect coastal and riverine areas by changing erosion and sedimentation rates. Beaches, coastal landscapes, and near-coastal riverine areas exposed to increased wave force, run up, and total water levels could potentially erode more quickly than before. However, rivers and creeks are also predicted to experience flashier sedimentation pulse events from strong winter storms, punctuated by periods of drought. Therefore, depending on precipitation patterns, sediment deposition and accretion may accelerate along some shorelines and coasts.

Underwater current and circulation patterns and processes are anticipated to change as a result of warmer water temperatures, and changes in density and salinity. This atmospheric and oceanic interaction (i.e., storm-related water turbulence) could change the character of submerged lands in shallow nearshore environments, as the seafloor would be subjected to stronger energy forces as a result of inshore wave propagation during extreme storm events. Changes to nearshore currents (and water chemistry) in southern California are being monitored by the Southern California Coastal Ocean Observing System (SCCOOS); however, not enough is known about the potential climate change-driven changes to seafloor sediment at the Lease Modification Project site to draw conclusions about effects on the proposed intake screens and diffuser that Poseidon proposes to install on the risers (towers) of the existing Huntington Beach Generating Station (HBGS) subsea pipelines.

Governor Brown's Executive Order B-30-15 instructed all State agencies to take climate change into account in their planning and investment decisions and to give priority to actions that build climate preparedness The preceding discussion of climate change and sea-level rise is intended to provide the local/regional overview and context that the Commission staff considered pursuant to this Executive Order. Overall, because the existing HBGS pipelines are submerged (at a depth of approximately 33 feet mean lower low water [MLLW]) and the proposed wedgewire screens and multiport diffuser would also be submerged and located on the pipeline risers above the seafloor, the inundation/flooding risk presented by sea-level rise is not a factor affecting the Commission's jurisdiction at this time and location, and until more is observed or known about how climate effects alter sediments in the nearshore subtidal areas where the facilities are located, any conclusions or statements about risks would be speculative.

8.2 ENVIRONMENTAL JUSTICE CONSIDERATIONS

8.2.1 Background

Environmental justice is defined by California law as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." This definition is consistent with the Public Trust Doctrine principle that the management of trust lands is for the benefit of all people. The CSLC adopted an environmental justice policy in October 2002 to ensure that environmental justice is an essential consideration in the agency's processes, decisions, and programs. Through its policy, CSLC reaffirms its commitment to an informed and open process in which all people are treated equitably and with dignity, and in which its decisions are tempered by environmental justice considerations.

In keeping with its commitment to environmental sustainability and access to all, California was one of the first states to codify the concept of environmental justice in statute. Beyond the fair treatment principles described in statute, leaders in the environmental justice movement work to include in the decision-making process those individuals disproportionately impacted by project effects. The goal is that through equal access to the decision-making process, everyone has equal protection from environmental and health hazards and can live, learn, play, and work in a healthy environment.

In 2016, legislation was enacted to require local governments with disadvantaged communities, as defined in statute, to incorporate environmental justice into their general plans when two or more general plan elements (sections) are updated. The Governor's Office of Planning and Research, the lead state agency on planning issues, is developing updated guidance for local jurisdictions to incorporate environmental justice matters into their general plans and will be working with state agencies, local governments, and many partners throughout 2017 to create a technical assistance document.

The U.S. Council on Environmental Quality (CEQ 1997) Environmental Justice Guidance defines "minorities" as individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black not of Hispanic origin, or Hispanic. The total minority population is calculated by subtracting the white alone, not Hispanic or Latino population from the total population. According to the CEQ environmental justice guidelines, minority populations should be identified if:

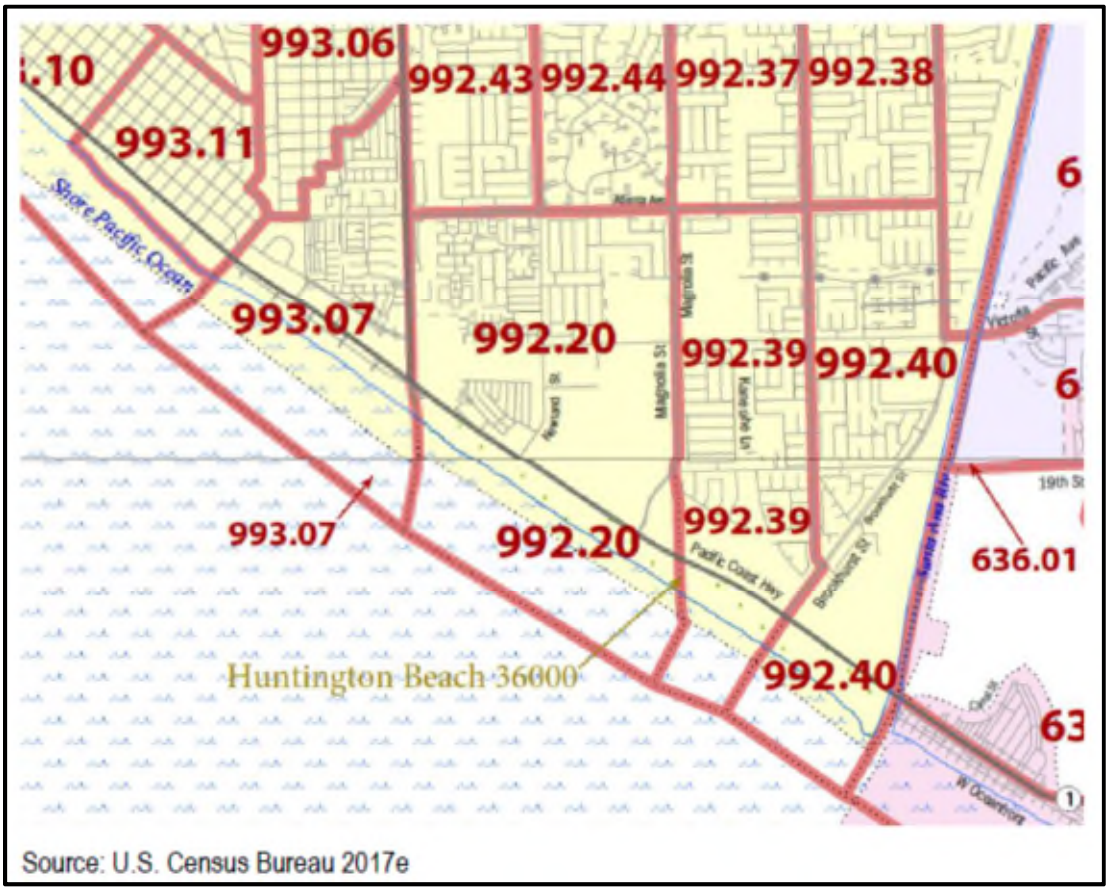
- A minority population percentage exceeds 50 percent of the population of the affected area

- The minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (for example, a governing body's jurisdiction, neighborhood census tract, or other similar unit)

In addition, the CEQ Environmental Justice Guidance defines "low-income populations" as populations with mean annual incomes below the annual statistical poverty level (CEQ 1997). The CEQ does not provide a discrete threshold for determining when a low-income population should be identified for environmental justice, however, for this analysis, an environmental justice population is identified if the low-income percentage of a census tract was found to be equal to or greater than those of Orange County or the City.

The current population of the City, in terms of its ethnicity (minority populations) and income (low-income populations), is defined based on the U.S. Census. Figure 8-1 identifies the tracts evaluated for the Lease Modification Project.

Figure 8-1 Census Tracts Near Project Vicinity



8.2.2 Minority Population

Table 8-1 presents the minority population composition of the regional and local study areas in the vicinity of the Lease Modification Project, based on the most recently available minority population information from U.S. Census 2010-2015 American Community Survey (ACS) data.[35] None of the census tracts closest to the offshore area contain a percentage of minority population that is greater than that of either the City or Orange County as a whole. The percentage of minority population living within these four local census tracts is similar among all four census tracts and is also similar to that of the City. Census Tracts 992.20 and 992.40 have minority populations that are approximately 10 percent less than that of the City, while Census Tract 992.39 contains the highest relative percentage of minority populations in the area. Regardless, the percentage of minority population living within the census tracts is significantly less than that of Orange County as a whole. No minority populations are identified that would be considered an environmental justice concern for activities associated with the Lease Modification Project.

Table 8-1. Minority Population Data

Geographic Area	Total Population	Total Minority Population[1]	Percent Minority Population[1]
Orange County	3,116,069	1,796,019	57.6%
City of Huntington Beach	197,752	70,072	35.4%
Census Tract 992.20	5,396	1,378	25.5%
Census Tract 992.39	3,754	1,161	30.9%
Census Tract 992.40	5,360	1,306	24.4%
Census Tract 993.07	2,577	794	30.8%

Source: U.S. Census Bureau, 2017a, 2017c, 2017e.
[1]Note: All population other than Non-Hispanic White

8.2.3 Low-Income Population

To determine poverty, the U.S. Census Bureau uses a set of official income thresholds that vary by family size and composition. These poverty thresholds are updated for inflation and do not vary geographically. If a family's total income is less than the family's threshold, then that family and every individual in it is considered to be in poverty (U.S. Census Bureau 2016).

[35] U.S. Census 2010-2015 ACS estimates come from a sample population, but are more current statistics than the most recent full census of 2010. Because they are based on a sample of population, a certain level of variability is associated with the estimates. Supporting documentation on ACS data accuracy and statistical testing can be found on the ACS website in the Data and Documentation section available here: www.census.gov/acs/www/data_documentation/documentation_main/.

As shown in Table 8-2, none of the four census tracts nearest the Lease Modification Project site contains a greater percentage of low-income population than that within either the City or Orange County as a whole. The percentage of the population living below the poverty level within the census tracts is similar between those tracts and lower than that of both the City and Orange County. None of the nearby census tracts are considered to be areas containing a low-income population of concern with respect to environmental justice.

Table 8-2 Low-Income Population Data

Geographic Area	Total Population for Whom Poverty Status is Determined[1]	Total Low-Income[2]	Percent Low-Income
Orange County	3,078,518	395,483	12.8%
City of Huntington Beach	196,930	18,474	9.4%
Census Tract 992.20	5,387	298	5.5%
Census Tract 992.39	3,754	237	6.3%
Census Tract 992.40	5,360	238	4.4%
Census Tract 993.07	2,537	198	7.8%

Source: U.S. Census Bureau, 2017b, 2017d, 2017e.
Notes:
1 The total population for whom poverty status is determined may vary from the total population
2 Proportion of the total population living below the poverty level

Impact Discussion

Potential impacts to nearby residents due to construction and operation activities are discussed in detail in Section 4.3, *Air Quality*. Some members of minority or low-income populations may be slightly affected by vessel emissions or construction noise. However, since the percentage of these populations in the closest census tracts are not disproportionately higher than in the surrounding area, these impacts from Lease Modification Project activities would not disproportionately affect minority or low-income populations. In addition, the distance between the Lease Modification Project site and residential communities, as well as the small scale and short-term duration of the Lease Modification Project construction and operation activities, ensures that impacts to all nearby residential communities would be minor, regardless of their socioeconomic makeup.

9.0 REPORT PREPARATION AND REFERENCES

This section presents the preparers and technical reviewers of this document and the list of references cited. A consultant team headed by Aspen Environmental Group prepared this document under the direction of the California State Lands Commission (CSLC).

9.1 CSLC STAFF

Alexandra Borack, Project Manager, Environmental Planning and Management Division

Cy R. Oggins, Chief, Environmental Planning and Management Division

Kathryn Colson and Jamie Garrett, Staff Counsel

9.2 CONSULTANT TEAM (UNDER CONTRACT TO CSLC)

ASPEN ENVIRONMENTAL GROUP

Susan Lee, Project Manager

Heather Blair, Deputy Project Manager

Brewster Birdsall, Senior Associate (Air Quality, Noise, Greenhouse Gas)

Michael McGowan, Senior Associate (Marine Biology and Water Quality)

Patrick Meddaugh, Staff

Melissa Do, Staff

Baron Creager, Staff

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

Peter Raimondi, Ph.D., Marine Biology

GRANITE FINANCIAL SYSTEMS

Marilyn Davin, Technical Editor

9.3 REFERENCES CITED

Alden (Alden Research Laboratory, Inc.). 2016. Huntington Beach Desalination Plant Intake/Discharge Feasibility Assessment. Report Prepared for Poseidon Water. March 14, 2016. (Included as Appendix H of Poseidon's Application to the CSLC.)

_____. 2017a. Huntington Beach Desalination Facility Discharge Diffuser Design. February 23. Report prepared for Poseidon Resources (Surfside) LLC. (Included as a supplement to Poseidon's Application to the CSLC.)

_____. 2017b. Summary of Head Loss Calculations for the Poseidon Huntington Beach Desalination Plant Discharge System. March 22. Technical memorandum prepared for Poseidon Resources (Surfside) LLC. (Included as a supplement to Poseidon's Application to the CSLC.)

Allen, S., J. Mortenson, and, S. Webb. 2011. *Field Guide to Marine Mammals of the Pacific Coast: Baja, California, Oregon, Washington, British Columbia.* University of California Press. Berkeley and Los Angeles, CA.

American Cetacean Society, Los Angeles Chapter (ACS/LA). 2016. ACS/LA Gray Whale Census And Behavior Project: 2015-2016. Retrieved in May 2017 from www.acs-la.org/census16-long.htm.

Ascon. 2017. Ascon Landfill Site website. Retrieved in May 2017 from www.ascon-hb.com/main.htm and www.ascon-hb.com/overall_project_status.htm.

Bartol, S. M., J. A. Musick, and M. L. Lenhardt. 1999. Auditory evoked potentials of the loggerhead sea turtle (*Caretta caretta*). Copeia, 1999: 836–840. (Cited in Greeneridge Sciences, Inc. 2005.)

Brown, Jerry. 2015. Governor's Executive Order # B-30-15. April 2015.

California Air Resources Board (CARB). 2014. Assembly Bill 32 Overview. Retrieved in May 2017 from www.arb.ca.gov/cc/ab32/ab32.htm.

_____. 2017. The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target. Retrieved in May 2017 from www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.

California Coastal Commission (CCC). 1987. California Coastal Resource Guide. University of California Press. Berkeley. pp. 53-55 (Living Resources, Mammals).

_____. 2017. Draft Technical Memorandum – Review and analysis of expected entrainment effects at and near Poseidon's proposed Huntington Beach Desalination Project. August 3, 2017.

California Department of Fish and Wildlife. 2017. California Natural Diversity Database (CNDDB) Quad Species List. Retrieved in September 2017 from https://map.dfg.ca.gov/bios/printTablePreview.html.

California Department of Parks and Recreation. 2017. Huntington State Beach. Retrieved in Department of Fish and Wildlife (CDFW). 2017. California South Coast MPAs. Retrieved May 2017 from www.parks.ca.gov/?page_id=643.

California Department of Transportation (Caltrans). 1998. Technical Noise Supplement. A Technical Supplement to the Traffic Noise Analysis Protocol. October 1998. Retrieved in May 2017 from http://www.dot.ca.gov/hq/env/noise/pub/Technical%20Noise%20Supplement.pdf.

_____. 2015. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Table 2-1 and Appendix I: Compendium of Pile Driving Sound Data. From "Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. November.

California Division of Tourism. 2017. "California Scenic Highway Mapping System: Orange County." Retrieved in May 2017 from www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/.

California Energy Commission (CEC). 2014a. Huntington Beach Energy Project: Final Decision. November. Retrieved in May 2017 from http://docketpublic.energy.ca.gov/PublicDocuments/12-AFC-02/TN203309_20141104T125516_Final_Commission_Decision.pdf.

_____. 2014b. Final Staff Assessment, Huntington Beach Energy Project, Docket Number 12-AFC-02. May. Retrieved in May 2017 from www.energy.ca.gov/sitingcases/huntington_beach_energy/index.html.

_____. 2016. Huntington Beach Energy Project FSA, Part 1 for the Petition to Amend the Huntington Beach Energy Project Decision. October. Retrieved in May 2017 from http://docketpublic.energy.ca.gov/PublicDocuments/12-AFC-02C/TN214025_20161017T134120_Final_Staff_Assessment__Part_1.pdf.

California Fish and Game Commission (FGC). 2017a. Letter from Eric Sklar, OCWD President, to Chair Dayna Bochco and members of the California Coastal Commission, February 1, 2017.

_____. 2017b. Staff Summary for August 16, 2017 "Items of Interest from Previous Meetings (Marine)" from the August 16, 2017 Commission Meeting. Retrieved in September 2017 from https://nrm.dfg.ca.gov/Documents/ContextDocs.aspx?cat=FGCStaff.

California Sea Grant. 2017. "South Coast." Retrieved in May 2017 from https://caseagrant.ucsd.edu/project/discover-california-commercial-fisheries/regions/south-coast.

California State Lands Commission (CSLC). 2012. Initial Study/Mitigated Negative Declaration, San Onofre Nuclear Generating Station Units 2 & 3, Offshore Large Organism Exclusion Device Installation Project. October.

_____. 2017. California Shipwrecks. Retrieved in May 2017 from www.slc.ca.gov/Info/Shipwrecks.html.

Council on Environmental Quality (CEQ). 1997. Environmental Justice Guidance under the National Environmental Policy Act. December 10.

City of Huntington Beach. 2001. City of Huntington Beach General Plan – Coastal Element. Amended October 2011. Retrieved in May 2017 from

www.huntingtonbeachca.gov/files/users/planning/Coastal_Elem_Goals_Obj_Pol.pdf.

_____. 2010. Final Subsequent Environmental Impact Report for the Seawater Desalination Project at Huntington Beach. August.

_____. 2011. Energy Action Plan. April. Retrieved in May 2017 from http://action.theenergynetwork.com/home/showdocument?id=26.

_____. 2016. 2015 Urban Water Management Plan: Final. June 2016. Retrieved in September 2017 from http://www.huntingtonbeachca.gov/files/users/public_works/urban-water-plan.pdf.

_____. 2017a. Ordinance No. 4118, Amending Chapter 13.08 of the City of Huntington Beach Municipal Code Relating to Beach Regulations. Retrieved in May 2017 from www.qcode.us/codes/huntingtonbeach/revisions/4118.pdf.

_____. 2017b. Parks and Recreation. Retrieved in May 2017 from www.huntingtonbeachca.gov/about/parks_recreation/.

Council on Environmental Quality (CEQ). 1997. Environmental Justice Guidance Under the National Environmental Policy Act. Washington, DC.

Department for Environment, Food, and Rural Affairs – Centre for Environment, Fisheries & Aquaculture Science, Suffolk, UK. 2009. A generic investigation into noise profiles of marine dredging in relation to the acoustic sensitivity of the marine fauna in UK waters with particular emphasis on aggregate dredging: PHASE 1 Scoping and review of key issues. MEPF Ref No. MEPF/08/P21. February.

Department of Toxic Substances Control (DTSC). 2017. Preliminary Phase of Remedial Work Known As Lagoon Solidification & Oil Well Abandonment Will Begin in July 2017 at Ascon Landfill Site, Huntington Beach. July.

Dudek. 2016a. Huntington Beach Desalination Project Wedgewire Screen Intake and Diffuser Environmental Analysis. Report prepared for Poseidon Resources (Surfside) LLC. June 17, 2016. (Included as Appendix HH of Poseidon's Application to the CSLC.)

_____. 2016b. Noise Modeling Results in Attachment D to Appendix HH – Memo to Poseidon Resources (Surfside) LLC. Huntington Beach Desalination Project Wedgewire Screen Intake and Diffuser Environmental Analysis. Dated: June 17, 2016.

_____. 2017. Huntington Beach Desalination Plant Supplemental Application Materials. February 20.

Ecosystems Management Associates, Inc. (ECO-M). 2015. Huntington Beach Seawater Desalination Facility Offshore Geophysical Survey and Shallow Subsurface

Geology. Report Prepared Poseidon Resources (Surfside) LLC. Revised Final June 1, 2015. (Included as Appendix A6 to Poseidon's Application to the CSLC.)

European Commission Joint Research Centre. 2016. Emission Database for Global Atmospheric Research (EDGAR). 2016. GHG (CO_2, CH_4, N_2O, F-gases) emission time series 1990-2012 per region/country. Retrieved in May 2017 from http://edgar.jrc.ec.europa.eu/overview.php?v=GHGts1990-2010.

Federal Transit Administration (FTA). 2006. Transit Noise and Vibration Impact Assessment. May. Retrieved in May 2017 from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Noise_and_Vibration_Manual.pdf.

Finneran, J. J., and A. K. Jenkins. 2012. Criteria and thresholds for U.S. Navy acoustic and explosive effects analysis. SPAWAR Systems Center Pacific, San Diego, CA. 60 p. (Cited in Greeneridge Sciences, Inc. 2005.)

Fisheries Hydroacoustic Working Group (FHWG). 2008. Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities. June 12, 2008. Retrieved in May 2017 from www.dot.ca.gov/hq/env/bio/files/fhwgcriteria_agree.pdf.

Gelpi, C.G., Norris, K.E. 2008. Seasonal temperature dynamics of the upper ocean in the Southern California Bight. JGR Oceans 113(C4). Retrieved in May 2017 from http://onlinelibrary.wiley.com/doi/10.1029/2006JC003820/full.

GHD. 2017a. HBDP Outfall Summary. Memorandum prepared for Poseidon Resources (Surfside) LLC. April 12.

_____. 2017b. HBDP Outfall – Salinity Comments. Memorandum prepared for Poseidon Resources (Surfside) LLC. April 25.

Greeneridge Sciences, Inc. 2005. Underwater Noise Impacts of Encina Power Station's Marine Oil Terminal Decommissioning, Carlsbad, California, 2015. Report prepared for Padre Associates, Inc. (Included as Appendix J, Underwater Noise Impacts of Encina Power Stations Marine Oil Terminal Decommissioning, Carlsbad, California 2015 (Greeneridge Sciences Report 518-1), Prepared by Greeneridge Sciences, Inc.) March 2015.

HDR Engineering, Inc. (HDR). 2016. Technical Memorandum: Evaluation of a Long-Distance Offshore Intake for the Huntington Beach Desalination Plant. Report Prepared for Poseidon Water. April 29, 2016. (Included as Appendix BB to Poseidon's Application to the CSLC.)

_____. 2017. Letter to Poseidon Resources (Surfside) LLC: Huntington Beach Desalination Plant Intake Biofouling. April 25.

Huntington Beach Wetlands Conservancy. 2017. "What We Do." Retrieved in May 2017 from www.hbwetlands.org/whatwedo.php.

Independent Scientific Advisory Panel (ISTAP). 2014. Final Report: Technical Feasibility of Subsurface Intake Designs for the Proposed Poseidon Water Desalination Facility at Huntington Beach, California. October 9.

_____. 2015. Phase II Report: Feasibility of Subsurface Intakes Designs for the Proposed Poseidon Water Desalination Facility at Huntington Beach, California. Prepared under the auspices of the California Coastal Commission and Poseidon Resources (Surfside) LLC. November 9.

Intergovernmental Panel on Climate Change (IPCC). 2014. Summary for Policymakers, In: Climate Change 2014, Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

International Commission on Stratigraphy. 2016. International Chronostratigraphic Chart. Retrieved in May 2017 from www.stratigraphy.org/ICSchart/ChronostratChart2016-12.pdf.

Irvine Valley College. 2017. The Geologic History of Orange County. Retrieved in May 2017 from http://academics.ivc.edu/physci/geology/pages/ocgeo.aspx.

Ketten, D., and S. M. Bartol. 2006. Functional measures of sea turtle hearing. Final report for Office of Naval Research, Boston, MA, N00014-02-1-0510. 4 p. (Cited in Greeneridge Sciences, Inc. 2005.)

Marine Exchange Southern California (MXSocal) and U.S. Coast Guard (USCG). 2015. Los Angeles-Long Beach Vessel Traffic Service (VTS) User Manual. Revised July 01, 2015. Retrieved in May 2017 from www.mxsocal.org/assets/usermanual-mx-vts-la.lb-1-july-2015.pdf.

Martin, K. J., S. C. Alessi, J. C. Gaspard, A. D. Tucker, G. B. Bauer, and D. A. Mann. 2012. Underwater hearing in the loggerhead turtle (*Caretta caretta*): A comparison of behavioral and auditory evoked potential audiograms. J. Exp. Biol., 215: 3001–3009. (Cited in Greeneridge Sciences, Inc. 2005.)

MBC Applied Environmental Sciences (MBC) and Tenera. 2005. AES Huntington Beach L.L.C. Generating Staton Entrainment and Impingement Study: Final Report. Report prepared for AES Huntington Beach L.L.C. and the California Energy Commission. April 2005.

Michael Baker International (MBI). 2015. Conventional Diffuser Retrofit at Huntington Beach Desalination Facility. March 27, 2015. (Included as Appendix S to Poseidon's Application to the CSLC.)

_____. 2017a. Dilution Analysis Alden 3-Jet Duckbill Diffuser Retrofit at Huntington Beach Desalination Facility (HBDF). Memo prepared for Poseidon Resources (Surfside) LLC. February 28, 2017.

_____. 2017b. Alternative Hydrodynamic Model Analysis Alden 3-Jet Duckbill Diffuser Retrofit at Huntington Beach Desalination Facility (HBDF). Memo prepared for Poseidon Resources (Surfside) LLC. July 28, 2017.

Michel, J. H., Powell, C. A., & Michels, H. T. 2011. An Assessment of the Biofouling Resistance And Copper Release Rate of 90-10 Copper-Nickel Alloy. NACE International.

Minerals Management Service (MMS). 2006. Biological Evaluation of Steller's Eider, Spectacled Eider, and Kittlitz's Murrelet. March. Retrieved in May 2017 from https://www.boem.gov/uploadedFiles/BOEM/About_BOEM/BOEM_Regions/Alaska_Region/Environment/Environmental_Analysis/final_be_birds.pdf. .

National Marine Fisheries Service (NMFS). 2012. Guidance Document: Sound Propagation Modeling to Characterize Pile Driving Sounds Relevant to Marine Mammals. January. Retrieved in May 2017 from http://www.westcoast.fisheries.noaa.gov/publications/protected_species/marine_mammals/killer_whales/esa_status/characterize_sound_propagation_modeling_guidance_memo.pdf.

_____. 2016. Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Dept. of Commerce, NOAA. NOAA Technical Memorandum NMFS-OPR-55, 178 p. July.

National Oceanic and Atmospheric Administration (NOAA). 2016. Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing; Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts. NOAA Technical Memorandum NMFS-OPR55. July.

Naval Facilities Engineering Command Southwest (NAVFAC SW). 2014. Naval Base Point Loma Fleet Logistics Center fuel pier replacement project: Acoustic, marine mammal, green sea turtle, and California least tern monitoring report, San Diego. 98 p. Retrieved in May 2017 from www.nmfs.noaa.gov/pr/permits/incidental/construction/navy_pointloma_monitoring2013.pdf.

Newport Landing. 2017. "Sportfishing." Retrieved in May 2017 from www.newportlanding.com/fish.htm.

Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency (OEHHA). 2013. Indicators of Climate Change in California.

O'Malley, James. Aspen. 2017. Conversation between Aspen staff and James O'Malley (Vice President of Development, Shopoff Realty Investments). February 24.

Orange County Water District (OCWD). 2015a. Orange County Water District Groundwater Management Plan 2015 Update. June 17, 2015. Retrieved in

September 2017 from https://www.ocwd.com/media/3622/groundwatermanagementplan2015update_20150624.pdf.

_____. 2015b. Term Sheet Water Reliability Agreement Huntington Beach Seawater Desalination Project Orange County Water District and Poseidon Resources (Surfside) LLC. May. Retrieved in May 2017 from https://www.ocwd.com/media/3189/ocwd-desal-term-sheet-fact-sheet-final.pdf.

_____. 2017a. About GWRS. Retrieved in September 2017 from https://www.ocwd.com/gwrs/about-gwrs/.

_____. 2017b. Letter from Michael R. Markus, OCWD General Manager, to Kurt Berchtold, Santa Ana RWQCB, March 20, 2017.

_____. 2017c. Letter from Michael R. Markus, General Manager, to The Honorable Gavin Newsom, State Lands Commission, September 8, 2017.

Pacific Institute. 2013. Key Issues in Seawater Desalination in California: Energy and Greenhouse Gas Emissions. (Cited in SWRCB 2015a.)

Popper, A. N., A. D. Hawkins, R. R. Fay, D. A. Mann, S. Bartol, T. J. Carlson, S. Coombs, W. T. Ellison, R. L. Gentry, M. B. Halvorsen, S. Lokkeborg, P. H. Rogers, B. L. Southall, D. G. Zeddies, and W. N. Tavolga. 2014. Sound exposure guidelines for fishes and sea turtles: A technical report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI, ASA S3/SC1.4 TR-2014. ASA Press and Springer Briefs in Oceanography, U.S.A. 73 p.

Port of Long Beach (POLB). 2015. Port of Long Beach: Air Emissions Inventory – 2015. Retrieved in May 2017 from http://polb.com/civica/filebank/blobdload.asp?BlobID=13555.

Poseidon Resources (Surfside) LLC (Poseidon). 2016a. Application for Amendment - Amendment of PRC 1980.1 Right of Way Lease for the Huntington Beach Seawater Desalination Project. July 15.

_____. 2016b. Project Description: Wedgewire Screen Intake and Diffuser. June 16, 2016. Included as Appendix JJ to Poseidon's Application to the CSLC.)

_____. 2016c. Submittal of Report of Waste Discharge Renewal of NPDES No. CA8000403 Huntington Beach Desalination Project. June 30.

_____. 2017a. Huntington Beach Desalination Project: Response to Data Request 1. February 14.

_____. 2017b. Huntington Beach Desalination Project: Response O-2 to Data Request 3. February 27.

_____. 2017c. Huntington Beach Seawater Desalination Project. Energy Minimization and Greenhouse Gas Reduction Plan (2017 GHG Plan). February 27, 2017.

_____. 2017d. Huntington Beach Desalination Project: Response to State Lands Commission March 14, 2017 Request for Additional Information. March 22.

Raimondi, P. 2011. Variation in Entrainment Impact Estimations Based on Different Measures of Acceptable Uncertainty. Report prepared for the California Energy Commission. August 2011.

Ridgway, S. H., E. G. Wever, J. G. McCormick, J. Palin, J. H. Anderson. 1969. Hearing in the giant sea turtle, *Chelonia mydas*. P. Nat. Acad. Sci., 64(3): 884-890. (Cited in Greeneridge Sciences, Inc. 2005.)

Santa Ana Regional Water Quality Control Board (Santa Ana RWQCB). 2014. Waste Discharge Requirements for AES Huntington Beach, L.L.C. Huntington Beach Generating Station Orange County. (Included as Attachment F, Fact Sheet, of the AES Huntington Beach Generating Station 2014 NPDES PERMIT, Order No. R8-2014-0076, NPDES No. CA0001163.) Retrieved in May 2017 from www.waterboards.ca.gov/rwqcb8/board_decisions/adopted_orders/orders/2014/14_076_AES_Huntington_Beach_Supersedes_2006-11.pdf.

Schwarzenegger, Arnold. 2005. Governor's Executive Order # S-03-05. June 2005.

Shopoff Realty Investments (Shopoff). 2017. "Magnolia Tank Farm." Retrieved in May 2017 from https://magnoliatankfarm.com/.

Southall, B. L., A. E. Bowles, W. T. Ellison, J. J. Finneran, R. L. Gentry, C. R. Greene, Jr., D. Kastak, D. R. Ketten, J. H. Miller, P. E. Nachtigall, W. J. Richardson, J. A. Thomas, and P. L. Tyack. 2007. Marine mammal noise exposure criteria: Initial scientific recommendations. Aquat. Mamm., 33: 411-521.

South Coast Air Quality Management District (SCAQMD). 2008. Final Localized Significance Threshold Methodology. Revised July 2008.

_____. 2009a. AQMD Board Establishes an Air Quality Investment Program for Greenhouse Gases. February 6, 2009. Retrieved in May 2017 from www.aqmd.gov/home/library/public-information/2009-news-archives/greenhouse-gas-program.

_____. 2009b. Final Localized Significance Threshold Methodology, Appendix C – Localized Significance Threshold Screening Tables. Revised October 21, 2009.

_____. 2015. SCAQMD Air Quality Significance Thresholds. Revision: March 2015.

_____. 2016a. Final 2016 Air Quality Management Plan. March 2017. Retrieved in May 2017 from www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

_____. 2016b. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin . February 2016. Retrieved in April 2017 from www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf?sfvrsn=2.

State Water Resources Control Board (SWRCB). 2010. Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (Once-Through Cooling Water (OTC) Policy). Adopted May 4, 2010. Retrieved in May 2017 from www.swrcb.ca.gov/water_issues/programs/ocean/cwa316/policy.shtml.

_____. 2015a. Final Staff Report Including the Final Substitute Environmental Documentation. Amendment to the Water Quality Control Plan For Ocean Waters of California Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes. Adopted May 6, 2015. Retrieved in May 2017 from www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/rs2015_0033_sr_apx.pdf.

_____. 2015b. Water Quality Control Plan for Ocean Waters of California (California Ocean Plan). Retrieved in May 2017 from www.swrcb.ca.gov/water_issues/programs/ocean/docs/cop2015.pdf.

_____. 2017. California's Areas of Special Biological Significance. Retrieved in May 2017 from www.swrcb.ca.gov/water_issues/programs/ocean/asbs_map.shtml.

Stuedlein, A. W., and T. Meskele. 2013. Analysis and design of pipe ramming installations. Final report SPR710 for Oregon Department of Transportation, Salem, OR. 218 p. Retrieved in May 2017 from www.oregon.gov/ODOT/TD/TP_RES/ResearchReports/SPR710_PipeRamming.pdf.

Supreme Court of California. 2015. California Building Industry Association, Plaintiff and Respondent, v. Bay Area Air Quality Management District, Defendant and Appellant. No. S213478. Decided: December 17, 2015.

Surf City USA. 2017. U.S. Open of Surfing. Retrieved in May 2017 from https://www.surfcityusa.com/events/signature-events/us-open-of-surfing/.

Tebaldi, C., B. H. Strauss and C. E. Zervas. 2012. Modelling sea level rise impacts on storm surges along US coasts. Environ. Res. Lett. 7 (2012) 014032 (11pp).

Tenera Environmental (Tenera). 2015 Memorandum on approach for APF calculations at Huntington Beach. Memo prepared for Poseidon Resources (Surfside) LLC. July 1, 2015. (Included as Appendix V to Poseidon's Application to the CSLC.)

_____. 2016. Benthic Resource Assessment of Potential Anchor Locations Offshore of the Proposed Poseidon Huntington Beach Desalination Plant. Report Prepared

for Dudek and Poseidon Resources (Surfside) LLC. May 3, 2016. Included as Attachment C to Appendix HH to Poseidon's Application to the CSLC.)

Tongva People. 2017. "Villages." Retrieved in May 2017 from www.tongvapeople.org/?page_id=696.

U.S. Census Bureau (United States Department of Commerce, Census Bureau). 2017a. 2010-2015 American Community Survey 5-Year Estimates, Data Set B03002: Hispanic or Latino Origin by Race. Retrieved in May 2017 from http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t.

_____. 2017b. 2010-2015 American Community Survey 5-Year Estimates, Data Set S1701: Poverty Status in the Past 12 Months. Retrieved in May 2017 from http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t.

_____. 2017c. 2010-2015 American Community Survey 5-Year Estimates, Table DP05 - ACS Demographic and Housing Estimates. Retrieved in May 2017 from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF.

_____. 2017d. 2010-2015 American Community Survey 5-Year Estimates, Table S1701 - Poverty Status in the Past 12 Months. Retrieved in May 2017 from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF.

_____. 2017e. 2010 Census - Census Tract Reference Map: Orange County, CA. Retrieved in May 2017 from http://www2.census.gov/geo/maps/dc10map/tract/st06_ca/c06059_orange/DC10CT_C06059_001.pdf.

U.S. Department of Transportation (DOT) Federal Highway Administration. 2015. Guidelines for the Visual Impact Assessment of Highway Projects. FHWA-HEP-15-029. January. pp. 3-1 to 3-6. https://www.environment.fhwa.dot.gov/guidebook/documents/VIA_Guidelines_for_Highway_Projects.asp.

U.S. Environmental Protection Agency (USEPA). 2014. DRAFT Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2012. February 21. p. ES-22. https://www.epa.gov/sites/production/files/2015-12/documents/us-ghg-inventory-2014-main-text.pdf.

U.S. Fish and Wildlife Service (USFWS). 2007a. Orange County Central-Coastal NCCP/HCP FAQ. https://www.fws.gov/carlsbad/HCPs/FAQ%20Orange%20County%20Central%20Coastal%20NCCP%20and%20HCPsjw.pdf.

_____. 2007b. Orange County Southern Subregion HCP FAQ. https://www.fws.gov/carlsbad/HCPs/FAQ%20Orange%20County%20Southern%20Subregion%20HCPsjw%20web.pdf.

_____. 2012. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover; Final Rule. Federal Register 77(118): 36728-36869.

_____. 2014. Endangered and Threatened Wildlife and Plants; Reclassifying the Tidewater Goby From Endangered to Threatened. Federal Register Volume 79, Number 49 (Thursday, March 13, 2014). Retrieved in September 2017 from https://www.gpo.gov/fdsys/pkg/FR-2014-03-13/pdf/2014-05335.pdf.

_____. 2017. Marine Mammals; Incidental Take During Specified Activities; Proposed Incidental Harassment Authorization. Federal Register Volume 82, Number 12 (Thursday, January 19, 2017). Retrieved in May 2017 from https://www.gpo.gov/fdsys/pkg/FR-2017-01-19/html/2017-01271.htm.

U.S. Geological Survey (USGS). 2017. Mineral Resources On-line Spatial Data for Orange County. Retrieved in May 2017 from https://mrdata.usgs.gov/mrds/select.php?place=f06059&div=fips.

Warrington, D.C. 1992. Vibratory and Impact-Vibration Pile Driving Equipment. Vulcan Iron Works Inc. 51 p. Retrieved in May 2017 from www.vulcanhammer.info/vibro/Vibrator.pdf.

Washington State Department of Transportation. 2010, Underwater Sound Levels Associated with Driving Steel Piles for the State Route 520 Bridge Replacement and HOV Project Pile Installation Test Program. Prepared By Illingworth & Rodkin, Inc. Retrieved in May 2017 from https://www.wsdot.wa.gov/NR/rdonlyres/E12A70C2-7A11-4F83-A37B-6C1D4F22694B/0/SR520PileHydroacousticRpt.pdf.

WE Energies, Filtration-Separation.com and Cook Legacy Water & Energy. 2013. Product Overview: Wedgewire Screens. Retrieved in May 2017 from www.waterscreen.com/intake-systems.html.

Wetlands & Wildlife Care Center. 2017. “Mission Statement.” Retrieved in May 2017 from www.wwccoc.org/about-us.html.