CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

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TENTATIVE ORDER NO. R9-2019-0003
NPDES NO. CA0109223

WASTE DISCHARGE REQUIREMENTS FOR THE POSEIDON RESOURCES (CHANNELSIDE) LP CLAUDE "BUD" LEWIS CARLSBAD DESALINATION PLANT DISCHARGE TO THE PACIFIC OCEAN

The following Discharger is subject to waste discharge requirements (WDRs) set forth in this Order:

Table 1. Discharger Information

Discharger:	Poseidon Resources (Channelside) LP
Facility:	Claude "Bud" Lewis Carlsbad Desalination Plant
Facility Address:	4590 Carlsbad Boulevard
	Carlsbad, CA 92008
	San Diego County

Table 2. Discharge Location

Discharge Point No.	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Reverse osmosis concentrate, filter backwash, potable water, and bypassed seawater	33º 8' 17" N	117º 20' 25" W	Pacific Ocean

Table 3. Administrative Information

This Order was adopted on:	**May~~rch 138~~, 2019**
This Order shall become effective on:	**July~~May~~ 1, 2019**
This Order shall expire on:	**June ~~April~~ 30, 2024**
The Discharger shall file a Report of Waste Discharge as an application for reissuance of WDR's in accordance with title 23, California Code of Regulations (CCR), and an application for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit no later than:	**180 days prior to the Order expiration date**
The U.S. Environmental Protection Agency (U.S. EPA) and the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) have classified this discharge as follows:	**Major**

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the San Diego Water Board on May~~rch 138~~, 2019.

TENTATIVE
David W. Gibson, Executive Officer

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I. FACILITY INFORMATION

The Claude "Bud" Lewis Carlsbad Desalination Plant (Facility) is a seawater desalination plant located on the shores of Agua Hedionda Lagoon in Carlsbad, CA. The Facility currently produces up to 54 million gallons per day (MGD) of potable drinking water for the San Diego County Water Authority (SDCWA). Poseidon Resources (Channelside) LP (Poseidon or Discharger) is the current owner and operator of the Facility. However, the SDCWA has the option to purchase the Facility from Poseidon starting December 23, 2025.

The Facility was formerly co-located with the Encina Power Station, owned and operated by Cabrillo Power I LLC. The discharge from the Encina Power Station to the Pacific Ocean is regulated separately under Order No. R9-2006-0043, NPDES No. CA0001350. The Encina Power Station terminated power generation operations on December 11, 2018. At that time, the Facility initiated interim stand-alone operations utilizing the existing intake structure, screens, and pumps to provide the volume of seawater needed to produce potable water, and to provide dilution water for the reverse osmosis concentrate and filter backwash from the Facility prior to being discharged to the Pacific Ocean. Effluent from the Facility is monitored at Monitoring Location M-001 and the commingled effluent from the Facility and the Encina Power Station is currently monitored at Monitoring Location M-002. Future plans include constructing and operating new intake pumps and a new intake structure.

General information describing the Facility is summarized in Table 1. More detailed information, including information regarding the Discharger's permit application, is contained in sections I and II of the Fact Sheet (Attachment F).

II. FINDINGS

The San Diego Water Board finds:

A. Legal Authorities. This Order serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the California Water Code (Water Code or CWC) commencing with section 13260. This Order is also issued pursuant to section 402 of the federal Clean Water Act (CWA) and implements regulations adopted by the United States Environmental Protection Agency (U.S. EPA) and chapter 5.5, division 7 of the Water Code commencing with section 13370. This Order shall serve as a National Pollutant Discharge Elimination System (NPDES) permit authorizing the Discharger to discharge into waters of the U.S. at the discharge location described in Table 2 subject to the WDRs in this Order. This Order also serves as the Water Code section 13142.5(b) determination for the Facility.

B. Background and Rationale for Requirements. The San Diego Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for the requirements in this Order, is hereby incorporated into and constitutes Findings for this Order. Attachments A through E, G, and H are also incorporated into this Order.

C. Provisions and Requirements Implementing State Law. The provisions/requirements in subsections II.D, II.E, IV.C, VI.A.2, VI.A.3, VI.A.4, and VI.C.2-8 are included to implement State law only. These provisions/requirements are not required or authorized under the federal CWA; consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.

D. Water Code Section 13142.5(b) Determination. Water Code section 13142.5(b) requires that for each new or expanded coastal power plant or other 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. Chapter III.M of the *Water Quality Control Plan for Ocean Waters of California, California Ocean Plan* (Ocean Plan) provides the implementation provisions for desalination facilities to comply with Water Code section 13142.5(b). This Order Implements the Water Code section 13142.5(b) determination described in Attachments H.1 and H.2 (which may also be collectively referred to as Attachment H or Water Code section 13142.5(b) Determination) of this Order for Facility stand-alone[1] operations in accordance with Ocean Plan requirements. In making this Determination the San Diego Water Board evaluated a range of alternatives proposed by the Discharger for the best available site, design, technology, and mitigation measures to minimize intake and mortality of all forms of marine life and then determined the best combination of feasible alternatives to minimize intake and mortality of all forms of marine life. ~~Any potential future expansion, including any design change or operational change to the Facility that could increase the intake or mortality of all forms of marine life beyond that which is approved under this Order will require a Water Code 13142.5(b) determination in accordance with the Ocean Plan requirements.~~

This Water Code section 13142.5(b) Determination is based upon available information. The Determination is conditional in limited part on the results of the Multiport Diffuser Analysis (in section VI.C.2.a of the Order) which the San Diego Water Board expects will confirm the conclusion that flow augmentation provides a comparable level of intake and mortality of all forms of marine life to a multiport diffuser (see Ocean Plan chapter III.M.2.d.(2)(c)). As discussed in Attachment H, the Multiport Diffuser Analysis will obtain additional appropriate scientific data to establish a benchmark regarding the intake and mortality of all forms of marine life associated with a multiport diffuser. If, as expected, the Multiport Diffuser Analysis confirms this Order's conclusion that flow augmentation is comparable to a multiport diffuser in intake and mortality of all forms of marine life, then the condition will have no further effect. In this case, the results of the Multiport Diffuser Analysis will establish the level of intake and mortality of all forms of marine life for a multiport diffuser as the benchmark for comparison to the results of the flow augmentation empirical study required in section VI.C.2.b of the Order and as required by Ocean Plan chapter III.M.2.d.(2)(c)v. If instead the condition does not occur and the results of the Multiport Diffuser Analysis fail to confirm that flow augmentation provides a comparable level of intake and mortality of all forms of marine life as a multiport diffuser, a new Water Code section 13142.5(b) determination for the Facility will be required consistent with Ocean Plan chapter III.M.2.(a)(5) to select an appropriate brine discharge technology for the Facility. In addition, any potential future expansion, including any design change or operational change to the Facility that could increase the intake or mortality of all forms of marine life beyond that which is approved under this Order will require a new Water Code section 13142.5(b) determination in accordance with the Ocean Plan requirements.

E. Compliance Schedule. Pursuant to Ocean Plan chapter III.M.2.a.(5)(b), the San Diego Water Board may allow the Discharger up to five years to make modifications to the Facility required by thea ~~a~~ new Water Code section 13142.5(b) ~~d~~Determination, including but not limited to a new source water intake structure. The San Diego Water Board finds that a ~~five-year~~ compliance schedule of approximately 4.5 years to complete the intake structure modifications no later than December 11, 2023 is in the public interest so that the Facility can continue to provide drinking water to the region without interruption. This compliance schedule is also reasonably required for modification of the Facility to comply with the ~~d~~Determination and to allow interim intake and discharge operations during stand-alone operations to continue until the new intake structure and configuration is constructed and operational. Additional information regarding the compliance schedule is in section VI.C.7 of the Order, section VI.G of the Fact Sheet, and in Attachment H to the Order.

[1] The term stand-alone operations is defined in Attachment A of this Order.

F. California Environmental Quality Act (CEQA). The action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21100, et seq.) in accordance with section 13389 of the Water Code. The Water Code section 13142.5(b) ~~d~~Determination set forth in Attachments H.1 and H.2 to this Order is issued under state law authority only and is a discretionary approval subject to compliance with CEQA. In August 2016, the SDCWA certified the *Final Supplement to the Precise Development Plan and Desalination Plant Project Final Environmental Impact Report (EIR 03-05; State Clearinghouse No. 2004041081)* (Final SEIR). ~~In January 2019, the SDCWA approved the *Sixth Addendum to the Final EIR*.~~ Since certification of the FSEIR, the SDCWA finalized the *Sixth Addendum to the Final EIR* in February 2019. The San Diego Water Board independently considered the environmental effects of the project as described in the 2006 EIR, the 2016 Supplemental EIR, and addendums. Details of CEQA compliance are set forth in the Fact Sheet (Attachment F).

G. Executive Officer Delegation of Authority. The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to Water Code section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under Water Code section 13223 or this Order explicitly states otherwise.

H. Notification of Interested Parties. The San Diego Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe WDRs for the discharge and of its intent to make a Water Code section 13142.5(b) ~~d~~Determination and has provided them with an opportunity to submit their written comments and recommendations. The San Diego Water Board also provided an opportunity for the Discharger and interested agencies and persons to submit oral comments and recommendations at a public hearing. Details of the notification are provided in the Fact Sheet (Attachment F).

I. Consideration of Public Comment. The San Diego Water Board, in a public meeting, heard and considered all comments pertaining to the discharge and the Water Code section 13142.5(b) ~~d~~Determination. Details of the public hearing are provided in the Fact Sheet (Attachment F).

THEREFORE, IT IS HEREBY ORDERED, that this Order supersedes Order No. R9-2006-0065 except for enforcement purposes, and to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified in the order granting stay, the Discharger shall comply with the analogous portions of the previous Order (Order No R9-2006-0065, as amended by Order No. R9-2009-0038). This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order.

III. DISCHARGE PROHIBITIONS

A. The discharge of waste from the Facility to a location other than Discharge Point No. 001, unless specifically regulated by this Order or separate WDRs, is prohibited.

B. The Discharger must comply with Discharge Prohibitions contained in the Ocean Plan. All such prohibitions are incorporated into this Order as if fully set forth herein and summarized in Attachment G, *Ocean Plan and Basin Plan Prohibitions*, as a condition of this Order.

C. The Discharger must comply with applicable Waste Discharge Prohibitions contained in chapter 4 of the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). All such prohibitions are incorporated into this Order as if fully set forth herein and summarized in Attachment G, *Ocean Plan and Basin Plan Prohibitions,* as a condition of this Order.

D. The discharge of permitted wastes greater than the following flow rates in Table 4 is prohibited.

Table 4. Permitted Discharge Flows[1] at Monitoring Location M-001

Wastewater	Maximum Daily Flowrate (MGD)	Annual Average Flowrate (MGD)
Media Filtration Backwash	~~7~~ --	7
Reverse Osmosis Concentrate	~~60~~ --	60
Combined Discharge of Media Filtration Backwash and Reverse Osmosis Concentrate	67	--

[1] Startup maintenance flows, product water, and off-spec water may be temporarily discharged to the Pacific Ocean during initial plant start-up, during or after plant maintenance, or at other times when the Facility is otherwise not delivering potable water to the regional water system. Temporarily discharging such water to the Pacific Ocean does not constitute a “bypass” as defined in Attachment A, and Attachment D, Standard Provision I.G.1.a of this Order. All limits and requirements, including monitoring, specified in this Order remain applicable during these temporary discharges.

IV. EFFLUENT LIMITATIONS, INTAKE SPECIFICATIONS, AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations

1. The Discharger shall maintain compliance with the following effluent limitations in Table 5 with compliance measured at either Monitoring Location M-001 or M-002, as described in the Monitoring and Reporting Program (MRP, Attachment E). Compliance with these effluent limitations shall be determined separately for when the Facility is discharging brine and when the Facility is not discharging brine. Monitoring shall be reported for these periods separately consistent with the effluent monitoring provisions in section III.B of the MRP (Attachment E).

Table 5. Effluent Limitations[1]

Parameter	Monitoring Location	Units[2]	Effluent Limitations						
			Average Monthly	Average Weekly	Average Daily	Average Hourly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids (TSS)	M-001	mg/L	60	--	--	--	--	--	--
		lbs/day	119,095	--	--	--	--	--	--
pH	M-001	standard units	--	--	--	--	--	6.0	9.0
Oil and Grease	M-001	mg/L	25	40	--	--	--	--	75
		lbs/day	49,623	79,397	--	--	--	--	148,869
Settleable Solids	M-001	ml/L	1.0	1.5	--	--	--	--	3.0
Turbidity	M-001	NTU	75	100	--	--	--	--	225
Salinity	M-002	ppt[3]	--	--	42.0	--	--	--	--
Chronic Toxicity[4]	M-002	Pass / Fail	--	--	--	--	Pass[6]	--	--
OBJECTIVES FOR PROTECTION OF HUMAN HEALTH – CARCINOGENS[1]									
TCDD equivalents	M-001	µg/L	8.9E-08[5]	--	--	--	--	--	--
		lbs/day	1.77E-07						

Footnotes to this table are listed on the following page.

[1] See Attachment A for definitions, abbreviations, and a glossary of common terms used in this Order.
[2] The mass emission rate limitation (MER), in lbs/day, was calculated based on the following equation: MER (lbs/day) = 8.34 x Q x C, where Q is the flow rate of 238 MGD and C is the concentration in mg/L. A discharge flow rate of 238 MGD is an operational constraint of the Facility modeled with the highest concentration of brine discharged, 60 MGD, with the minimum amount of dilution water, 178 MGD, that is necessary to meet the salinity effluent limitation.
[3] "ppt" is parts per thousand.
[4] As specified in section III.C of the MRP (Attachment E).
[5] Scientific "E" notation is used to express the effluent limitations TCDD equivalents. In scientific "E" notation, the number following the "E" indicates that position of the decimal point in the value. Negative numbers after the "E" indicate that the value is less than 1, and positive numbers after the "E" indicate that the value is greater than 1. In this notation a value of 6.1E-02 represents 6.1 x 0.01 or 0.061, 6.1E+02 represents 6.1 x 10^2 or 610, and 6.1E+00 represents 6.1 x 10^0 or 6.1.
[6] As recommended in the USEPA's *Technical Support Document for Water Quality-based Toxics Control,* section 5.2.3, the maximum daily effluent limitation for chronic toxicity should be interpreted as signifying the maximum test result for the month.

B. Performance Goals

Parameters that do not have reasonable potential to cause or contribute to an exceedance of water quality objectives, or for which reasonable potential to cause or contribute to an exceedance of water quality objectives cannot be determined, are assigned performance goals. Performance goal parameters shall be monitored at Monitoring Location M-001. The performance goals in Table 6 below are not water quality-based effluent limitations (WQBELs) and are not enforceable.

Table 6. Performance Goals[1]

Parameter	Unit[3]	Performance Goals[2]			
		6-Month Median	Maximum Daily	Instantaneous Maximum	Average Monthly
OBJECTIVES FOR PROTECTION OF MARINE AQUATIC LIFE					
Arsenic, Total Recoverable	µg/L	1.2E+02	6.7E+02	1.8E+03	--
	lbs/day	2.33E+02	1.32E+03	3.50E+03	--
Cadmium, Total Recoverable	µg/L	2.28E+01	9.13E+01	2.28E+02	--
	lbs/day	4.53E+01	1.81E+02	4.53E+02	--
Chromium VI[4]	µg/L	4.57E+01	1.83E+02	4.57E+02	--
	lbs/day	9.06E+01	3.63E+02	9.06E+02	--
Copper, Total Recoverable	µg/L	2.48E+01	2.30E+02	6.41E+02	--
	lbs/day	4.93E+01	4.57E+02	1.27E+03	--
Lead, Total Recoverable	µg/L	4.57E+01	1.83E+02	4.57E+02	--
	lbs/day	9.06E+01	3.63E+02	9.06E+02	--
Mercury, Total Recoverable	µg/L	9.02E-01	3.64E+00	9.12E+00	--
	lbs/day	1.79E+00	7.23E+00	1.81E+01	--
Nickel, Total Recoverable	µg/L	1.14E+02	4.57E+02	1.14E+03	--
	lbs/day	2.27E+02	9.06E+02	2.27E+03	--
Selenium, Total Recoverable	µg/L	3.42E+02	1.37E+03	3.42E+03	--
	lbs/day	6.80E+02	2.72E+03	6.80E+03	--
Silver, Total Recoverable	µg/L	1.25E+01	6.04E+01	1.56E+02	--
	lbs/day	2.48E+01	1.20E+02	3.10E+02	--

Parameter	Unit[3]	Performance Goals[2]			
		6-Month Median	Maximum Daily	Instantaneous Maximum	Average Monthly
Zinc, Total Recoverable	µg/L	2.82E+02	1.65E+03	4.39E+03	--
	lbs/day	5.60E+02	3.28E+03	8.72E+03	--
Cyanide, Total Recoverable	µg/L	2.28E+01	9.13E+01	2.28E+02	--
	lbs/day	4.53E+01	1.81E+02	4.53E+02	--
Total Chlorine Residual	µg/L	4.57E+01	1.83E+02	1.37E+03	--
	lbs/day	9.06E+01	3.63E+02	2.72E+03	--
Ammonia (expressed as nitrogen)	µg/L	1.37E+04	5.48E+04	1.37E+05	--
	lbs/day	2.72E+04	1.09E+05	2.72E+05	--
Phenolic Compounds (non-chlorinated)	µg/L	6.85E+02	2.74E+03	6.85E+03	--
	lbs/day	1.36E+03	5.44E+03	1.36E+04	--
Chlorinated Phenolics	µg/L	2.28E+01	9.13E+01	2.28E+02	--
	lbs/day	4.53E+01	1.81E+02	4.53E+02	--
Endosulfan	µg/L	2.05E-01	4.11E-01	6.16E-01	--
	lbs/day	4.08E-01	8.16E-01	1.22E+00	--
Endrin	µg/L	4.57E-02	9.13E-02	1.37E-01	--
	lbs/day	9.06E-02	1.81E-01	2.72E-01	--
HCH	µg/L	9.13E-02	1.83E-01	2.74E-01	--
	lbs/day	1.81E-01	3.63E-01	5.44E-01	--
Radioactivity	pCi/L	Not to exceed limits specified in Title 17, division 1, chapter 5, subchapter 4, group 3, article 3, section 30253 of the CCR. Reference to section 30253 is prospective, including future changes to any incorporated provisions of federal law, as the changes take effect.			
OBJECTIVES FOR PROTECTION OF HUMAN HEALTH – NONCARCINOGENS					
Acrolein	µg/L	--	--	--	5.02E+03
	lbs/day	--	--	--	9.97E+03
Antimony	µg/L	--	--	--	2.74E+04
	lbs/day	--	--	--	5.44E+04
Bis(2-chloroethoxy) Methane	µg/L	--	--	--	1.00E+02
	lbs/day	--	--	--	1.99E+02
Bis(2-chloroisopropyl) Ether	µg/L	--	--	--	2.74E+04
	lbs/day	--	--	--	5.44E+04
Chlorobenzene	µg/L	--	--	--	1.30E+04
	lbs/day	--	--	--	2.58E+04
Chromium (III)	µg/L	--	--	--	4.34E+06
	lbs/day	--	--	--	8.61E+06
Di-n-butyl Phthalate	µg/L	--	--	--	7.99E+04
	lbs/day	--	--	--	1.59E+05

Parameter	Unit[3]	Performance Goals[2]			
		6-Month Median	Maximum Daily	Instantaneous Maximum	Average Monthly
Dichlorobenzenes	µg/L	--	--	--	1.16E+05
	lbs/day	--	--	--	2.31E+05
Diethyl Phthalate	µg/L	--	--	--	7.53E+05
	lbs/day	--	--	--	1.50E+06
Dimethyl Phthalate	µg/L	--	--	--	1.87E+07
	lbs/day	--	--	--	3.72E+07
4,6-dinitro-2-methylphenol	µg/L	--	--	--	5.02E+03
	lbs/day	--	--	--	9.97E+03
2,4-dinitrophenol	µg/L	--	--	--	9.13E+01
	lbs/day	--	--	--	1.81E+02
Ethylbenzene	µg/L	--	--	--	9.36E+04
	lbs/day	--	--	--	1.86E+05
Fluoranthene	µg/L	--	--	--	3.42E+02
	lbs/day	--	--	--	6.80E+02
Hexachlorocyclopentadiene	µg/L	--	--	--	1.32E+03
	lbs/day	--	--	--	2.63E+03
Nitrobenzene	µg/L	--	--	--	1.12E+02
	lbs/day	--	--	--	2.22E+02
Thallium, Total Recoverable	µg/L	--	--	--	4.57E+01
	lbs/day	--	--	--	9.06E+01
Toluene	µg/L	--	--	--	1.94E+06
	lbs/day	--	--	--	3.85E+06
Tributyltin	µg/L	--	--	--	3.20E-02
	lbs/day	--	--	--	6.34E-02
1,1,1-trichloroethane	µg/L	--	--	--	1.23E+07
	lbs/day	--	--	--	2.45E+07
OBJECTIVES FOR PROTECTION OF HUMAN HEALTH – CARCINOGENS					
Acrylonitrile	µg/L	--	--	--	2.28E+00
	lbs/day	--	--	--	4.53E+00
Aldrin	µg/L	--	--	--	5.02E-04
	lbs/day	--	--	--	9.97E-04
Benzene	µg/L	--	--	--	1.35E+02
	lbs/day	--	--	--	2.67E+02
Benzidine	µg/L	--	--	--	1.58E-03
	lbs/day	--	--	--	3.13E-03
Beryllium	µg/L	--	--	--	7.53E-01
	lbs/day	--	--	--	1.50E+00

Parameter	Unit[3]	Performance Goals[2]			
		6-Month Median	Maximum Daily	Instantaneous Maximum	Average Monthly
Bis(2-chloroethyl) Ether	µg/L	--	--	--	1.03E+00
	lbs/day	--	--	--	2.04E+00
Bis(2-ethylhexyl)phthalate	µg/L	--	--	--	7.99E+01
	lbs/day	--	--	--	1.59E+02
Carbon Tetrachloride	µg/L	--	--	--	2.05E+01
	lbs/day	--	--	--	4.08E+01
Chlordane	µg/L	--	--	--	5.25E-04
	lbs/day	--	--	--	1.04E-03
Chlorodibromomethane	µg/L	--	--	--	1.96E+02
	lbs/day	--	--	--	3.90E+02
Chloroform	µg/L	--	--	--	2.97E+03
	lbs/day	--	--	--	5.89E+03
DDT	µg/L	--	--	--	3.88E-03
	lbs/day	--	--	--	7.70E-03
1,4-dichlorobenzene	µg/L	--	--	--	4.11E+02
	lbs/day	--	--	--	8.16E+02
3,3'-dichlorobenzidine	µg/L	--	--	--	1.85E-01
	lbs/day	--	--	--	3.67E-01
1,2-dichloroethane	µg/L	--	--	--	6.39E+02
	lbs/day	--	--	--	1.27E+03
1,1-dichloroethylene	µg/L	--	--	--	2.05E+01
	lbs/day	--	--	--	4.08E+01
Dichlorobromomethane	µg/L	--	--	--	1.42E+02
	lbs/day	--	--	--	2.81E+02
Dichloromethane	µg/L	--	--	--	1.03E+04
	lbs/day	--	--	--	2.04E+04
1,3-dichloropropene	µg/L	--	--	--	2.03E+02
	lbs/day	--	--	--	4.03E+02
Dieldrin	µg/L	--	--	--	9.13E-04
	lbs/day	--	--	--	1.81E-03
2,4-dinitrotoluene	µg/L	--	--	--	5.94E+01
	lbs/day	--	--	--	1.18E+02
1,2-diphenylhydrazine	µg/L	--	--	--	3.65E+00
	lbs/day	--	--	--	7.25E+00
Halomethanes	µg/L	--	--	--	2.97E+03
	lbs/day	--	--	--	5.89E+03
Heptachlor	µg/L	--	--	--	1.14E-03
	lbs/day	--	--	--	2.27E-03

Parameter	Unit[3]	Performance Goals[2]			
		6-Month Median	Maximum Daily	Instantaneous Maximum	Average Monthly
Heptachlor Epoxide	µg/L	--	--	--	4.57E-04
	lbs/day	--	--	--	9.06E-04
Hexachlorobenzene	µg/L	--	--	--	4.79E-03
	lbs/day	--	--	--	9.52E-03
Hexachlorobutadiene	µg/L	--	--	--	3.20E+02
	lbs/day	--	--	--	6.34E+02
Hexachloroethane	µg/L	--	--	--	5.71E+01
	lbs/day	--	--	--	1.13E+02
Isophorone	µg/L	--	--	--	1.67E+04
	lbs/day	--	--	--	3.31E+04
N-nitrosodimethylamine	µg/L	--	--	--	1.67E+02
	lbs/day	--	--	--	3.31E+02
N-nitrosodi-N-propylamine	µg/L	--	--	--	8.68E+00
	lbs/day	--	--	--	1.72E+01
N-nitrosodiphenylamine	µg/L	--	--	--	5.71E+01
	lbs/day	--	--	--	1.13E+02
PAHs	µg/L	--	--	--	2.01E-01
	lbs/day	--	--	--	3.99E-01
PCBs	µg/L	--	--	--	4.34E-04
	lbs/day	--	--	--	8.61E-04
1,1,2,2-tetrachloroethane	µg/L	--	--	--	5.25E+01
	lbs/day	--	--	--	1.04E+02
Tetrachloroethylene	µg/L	--	--	--	4.57E+01
	lbs/day	--	--	--	9.06E+01
Toxaphene	µg/L	--	--	--	4.79E-03
	lbs/day	--	--	--	9.52E-03
Trichloroethylene	µg/L	--	--	--	6.16E+02
	lbs/day	--	--	--	1.22E+03
1,1,2-trichloroethane	µg/L	--	--	--	2.15E+02
	lbs/day	--	--	--	4.26E+02
2,4,6-trichlorophenol	µg/L	--	--	--	6.62E+00
	lbs/day	--	--	--	1.31E+01
Vinyl Chloride	µg/L	--	--	--	8.22E+02
	lbs/day	--	--	--	1.63E+03

[1] See Attachment A for definitions, abbreviations, and a glossary of common terms used in this Order.

[2] Scientific "E" notation is used to express certain values. In scientific "E" notation, the number following the "E" indicates that position of the decimal point in the value. Negative numbers after the "E" indicate that the value is less than 1, and positive numbers after the "E" indicate that the value is greater than 1. In this notation a value of 6.1E-02 represents 6.1×10^{-2} or 0.061, 6.1E+02 represents 6.1×10^{2} or 610, and 6.1E+00 represents 6.1×10^{0} or 6.1.

[3] The MER, in lbs/day, is calculated based on the following equation:

MER (lbs/day) = 8.34 x Q x C, where Q is a flow rate of 238 MGD, and C is the concentration in mg/L. A discharge flow ~~-~~rate of 238 MGD is an operational constraint of the Facility modeled with the highest concentration of brine discharged, 60 MGD, with the minimum amount of dilution water, 178 MGD, that is necessary to meet the salinity effluent limitation.

[4] The Discharger may, at their option, apply this performance goal as a total chromium performance goal.

C. Intake Specifications

The intake of seawater from Agua Hedionda Lagoon shall comply with these specifications following completion of the new intake structure in accordance with the time schedule described in section VI.C.7 of this Order and Attachment H of the Order:

1. The new intake structure shall be completely constructed and operable in accordance with the requirements of this Order;

2. The intake of seawater must not exceed 330 MGD with the existing intake pumps and 299 MGD with the new intake pumps;

3. Surface water intakes must be screened at the onset of the intake of seawater. Screens must be functional while the Facility is withdrawing seawater;

4. To reduce entrainment, all surface water intakes must be screened with a 1.0 mm (0.04 in.) or smaller slot size screen when the Facility is withdrawing seawater;

5. To minimize impingement, the through-screen velocity at the onset of the surface water intake must not exceed 0.15 meters per second (0.5 feet per second) at all times;

6. The intake of seawater shall be reduced to the minimum volume necessary to maintain Facility operations;

7. To the maximum extent practicable, ~~I~~in-plant recycling of waste streams shall be maximized before intaking additional seawater;

8. The Discharger shall cease intake of seawater except when intake of seawater is necessary to maintain Facility operations or to comply with this Order;

9. Heat treatment of the intake system is prohibited; and

10. Pump operations for intake of seawater with the new intake pumps shall minimize abrupt changes in flow velocity.

D. Discharge Specifications

The discharge of effluent from the Facility shall comply with the following:

11. Wastewater from the Facility must be discharged in a manner that provides sufficient initial dilution to comply with the limitations and specifications contained in sections IV and V of this Order and in compliance with the discharge prohibitions contained in section III of this Order.

12. Waste management systems that discharge to the Pacific Ocean must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community.

13. Waste discharged to the Pacific Ocean must be essentially free of:

a. Material that is floatable or will become floatable upon discharge;

b. Settleable material or substances that may form sediments which will degrade benthic communities or other aquatic life;

c. Substances which will accumulate to toxic levels in marine waters, sediments, or biota;

d. Substances that significantly decrease the natural light to benthic communities and other marine life; and

e. Materials that result in aesthetically undesirable discoloration of the ocean surface.

E. Land Discharge Specifications – Not Applicable

F. Recycling Specifications – Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

The receiving water limitations set forth below for ocean waters are based on water quality objectives contained in the Basin Plan and Ocean Plan and are a required part of this Order. The discharge of waste from the Facility shall not cause or contribute to a violation of these limitations in the Pacific Ocean. Compliance with limitation V.A.3.c for natural light, and V.A.4.g for Ocean Plan Table 1 Water Quality Objectives (excepting radioactivity) shall be determined outside the zone of initial dilution. Compliance with the salinity limitations shall be determined outside the brine mixing zone.

1. Salinity

The discharge shall not cause or contribute to an exceedance of 2.0 parts per thousand (ppt) above natural background salinity throughout the water column, measured at a point 200 meters from the end of the discharge channel.

Natural background salinity, as measured at a reference location that is representative of the salinity resulting from natural processes without human influence at the discharge location, will be used to evaluate compliance with the salinity receiving water limitation. The reference location shall be without human influence including wastewater outfalls and brine discharges. The reference location is the automated shore station at the end of Scripps Pier operated by Scripps Institution of Oceanography[2]. Historical salinity data has been collected continuously at this location since February 10, 2005. If this reference location becomes unavailable in the future, the Discharger shall submit for the San Diego Water Board's review and acceptance a proposed alternative reference location representative of natural background salinity.

2. Bacterial Characteristics

a. Within a zone bounded by the shoreline at mean sea level and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is farther from the shoreline, and in areas outside this zone used for water contact sports, as determined by the San Diego Water Board (i.e., waters designated as REC-1), but including all kelp beds, the following water quality objectives shall be maintained throughout the water column.

i. **Fecal Coliform.** A 30-day geometric mean (GM) of fecal coliform density not to exceed 200 per 100 milliliters (mL), calculated based on the five most recent samples from each site, and a single sample maximum (SSM) not to exceed 400 per 100 ml.

[2]More information in regard to the Scripps Pier shore station can be found at this website, current as of December 18, 2018: https://scripps.ucsd.edu/programs/shorestations/shore-stations-data/data-sio/

ii. **Enterococci.** A six-week rolling GM of enterococci not to exceed 30 colony forming units (cfu) per 100 milliliters (mL), calculated weekly, and a statistical threshold value (STV) of 100 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.

b. The zone of initial dilution of any wastewater outfall shall be excluded from designation as kelp beds for purposes of bacterial standards. Adventitious assemblages of kelp on waste discharge structures (e.g., outfall pipes and multiport diffusers) do not constitute kelp beds for purposes of bacterial standards.

c. At all areas where shellfish may be harvested for human consumption, as determined by the San Diego Water Board, the median total coliform density shall not exceed 70 per 100 mL throughout the water column, and not more than 10 percent of the samples shall exceed 230 per 100 mL.

3. Physical Characteristics

a. Floating particulates and grease and oils shall not be visible.

b. The discharge of waste shall not cause aesthetically undesirable discoloration of the ocean surface.

c. Natural light shall not be significantly reduced at any point outside the zone of initial dilution as a result of the discharge of waste.

d. The rate of deposition of inert solids and the characteristics of inert solids in the ocean sediments shall not be changed such that benthic communities are degraded.

e. Trash shall not be present in ocean waters, along shorelines, or in adjacent areas in amounts that adversely affect beneficial uses or cause nuisance.

f. The discharge of waste shall not cause the temperature of the receiving water to be altered in a manner that adversely impacts beneficial uses.

4. Chemical Characteristics

a. The dissolved oxygen concentration shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen demanding waste materials.

b. The pH shall not be changed at any time more than 0.2 units from that which occurs naturally.

c. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions.

d. The concentration of substances set forth in Table 1 of the Ocean Plan, shall not be increased in marine sediments to levels that would degrade indigenous biota.

e. The concentration of organic materials in marine sediments shall not be increased to levels that would degrade marine life.

f. Nutrient materials shall not cause objectionable aquatic growths or degrade indigenous biota.

g. Ocean Plan Table 1 water quality objectives apply to all discharges under this Order that are within the jurisdiction of the Ocean Plan. Unless otherwise specified, all metal concentrations are expressed as total recoverable concentrations.

5. Biological Characteristics

a. Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded.

b. The natural taste, odor, color of fish, shellfish, or other marine resources used for human consumption shall not be altered.

c. The concentration of organic materials in fish, shellfish, or other marine resources used for human consumption shall not bioaccumulate to levels that are harmful to human health.

6. Radioactivity

a. Discharge of radioactive waste shall not degrade marine life.

b. The radioactivity in the receiving waters shall not exceed limits specified in title 17, division 1, chapter 5, subchapter 4, group 3, section 30253 of the California Code of Regulations (CCR). Reference to section 30253 is prospective, including future changes to any incorporated provisions of federal law, as the changes take effect.

B. Groundwater Limitations – Not Applicable

VI. PROVISIONS

A. Standard Provisions

1. The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

2. The Facility shall be protected against a 100-year storm event as defined by the San Diego County Flood Control District (FCD).

3. The Facility shall be protected against erosion, overland runoff, and other impacts resulting from a 100-year, 24-hour storm event as defined by the San Diego FCD.

4. The Facility shall be protected to reduce infrastructure vulnerability to extreme wet weather events, flooding, storm surges, and projected sea level rise resulting from current and future impacts associated with climate change.

5. This Order expires on ~~March~~ June 30~~12~~, 2024, after which, the terms and conditions of this Order are automatically continued pending issuance of a new Order, provided that all requirements of U.S. EPA's NPDES regulations at title 40 of the Code of Federal Regulations (CFR) part 122.6 and the State's regulations at CCR title 23, section 2235.4 regarding the continuation of expired permits and waste discharge requirements are met.

6. The Water Code section 13142.5(b) ~~d~~Determination described in attachment H of this Order does not expire and shall remain in effect unless: (1) the Multiport Diffuser Analysis described in section VI.C.2.a of this Order fails to confirm that flow augmentation and multiport diffuser brine discharge technologies are comparable in intake and mortality to all forms of marine life and a new Water Code section 13142.5(b) determination is required consistent with Ocean Plan chapter III.M.2.a.(5); or (2) the Discharger proposes a change in design or operation of the Facility in a manner that could increase intake or mortality of all forms of marine life, consistent with the Ocean Plan definition of an expanded facility. Such a proposed change will require a new Water Code section 13142.5(b) determination for an expanded facility as required by the Ocean Plan chapter III.M.1.b.(3).

7. A full and complete copy of this Order shall be maintained at the Facility and shall be available to site personnel, San Diego Water Board, and the State Water Board at all times.

8. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges from this Facility, may subject the Discharger to administrative or civil liabilities, criminal penalties, and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject the Discharger to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.

B. MRP Requirements

The Discharger shall comply with the MRP, and future revisions thereto, in Attachment E of this Order.

Notifications required to be provided under this Order to the San Diego Water Board shall be made to:

E-mail – SanDiego@waterboards.ca.gov
Telephone – (619) 516-1990
Facsimile – (619) 516-1994

C. Special Provisions

1. Reopener Provisions

a. This Order may be reopened to modify provisions governing compliance with Water Code section 13142.5(b) and the Ocean Plan if a new Water Code section 13142.5(b) determination is required by the terms of this Order or if the Discharger proposes a change in design or operation of the Facility in a manner that could increase intake or mortality of all forms of marine life, consistent with the Ocean Plan definition of an expanded facility, beyond that which is approved in this Water Code section 13142.5(b) ~~d~~Determination. This Order may be reopened at any time for modification of provisions governing compliance with the receiving water limitation for salinity as set forth in Ocean Plan section III.M.3.

b. This Order may be reopened for modification of the MRP requirements and/or special studies requirements at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revisions (i) to implement recommendations from the Southern California Coastal Water Research Project (SCCWRP); (ii) to develop, refine, implement, and/or coordinate a regional monitoring program; (iii) to develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9 2012-0069, *Resolution in Support of a Regional Monitoring Framework*; and/or (iv) to add provisions to require the Discharger to evaluate and provide information on cost and values of the MRP (Attachment E).

c. This Order may be modified, revoked and reissued, or terminated for cause in accordance with the provisions of the Water Code and 40 CFR parts 122, 124, and 125 at any time prior to its expiration including, but not limited to, the following circumstances:

i. Violation of any terms or conditions of this Order. (Water Code section 13381(a))

ii. Obtaining this Order by misrepresentation or failure to disclose fully all relevant facts. (Water Code section 13381(b))

iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. (Water Code section 13381(c))

iv. The filing of a request by the Discharger for modifications, revocation and reissuance, or termination of this Order does not stay any condition of this Order. Notification by the Discharger of planned operational or Facility changes or anticipated noncompliance with this Order does not stay any condition of this Order. (40 CFR section 122.41(f))

v. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in this Order. (40 CFR section 122.44(b)(1))

vi. Monitoring establishes that incorporation of an effluent limitation(s) is necessary because the discharge causes, has the reasonable potential to cause, or contributes to an excursion above a performance goal(s) set forth in section IV.B, Table 6, of this Order or as otherwise described in Table 1 of the Ocean Plan. (40 CFR section 122.44(d)(1))

vii. To revise effluent limitations or to modify for consistency, as a result of new standards or regulations, such as Ocean Plan or Basin Plan Amendments and/or other statewide Water Quality Control Plan amendments, or the adoption of a total maximum daily load (TMDL) for the receiving water. (40 CFR section 122.62(a)(3))

2. Special Studies, Technical Reports, and Additional Monitoring Requirements

a. Multiport Diffuser Analysis (MDA).

i. In accordance with chapter III.M.2.d.(2)(c) of the Ocean Plan, within 180 days following the adoption of this Order, the Discharger shall submit a work plan (MDA Work Plan) for a study and subsequently a final report designed to:

(a) Confirm the Water Code section 13142.5(b) Determination that the level of intake and mortality of all forms of marine life estimated by using the flow augmentation discharge technology is comparable to the intake and mortality of all forms of marine life caused by a theoretical multiport diffuser in the Pacific Ocean; and

(b) Establish the benchmark to compare intake and mortality of all forms of marine life for a theoretical multiport diffuser for purposes of the comparison to flow augmentation in the *Brine Discharge Technology Empirical Study* described in section VI.C.2.b of this Order.

ii. The MDA Work Plan shall provide for an analysis of the intake and mortality to all forms of marine life caused by brine discharged through theoretical multiport diffusers at the proposed location station N4 (described in the Tenera 2008 study) in the Pacific Ocean. Collection of data at multiple potential diffuser locations in the Pacific Ocean shall also be considered. The MDA Work Plan shall provide for using the approach contained in the scientific report *Brine Diffusers and Shear Mortality,* Philip J.W. Roberts April 18, 2018, referenced as the Roberts Report in Finding 31 of Attachment H.1 of this Order. The MDA

Work Plan may also provide for conducting the analysis using an additional approach, in addition to using the Roberts Report approach.

iii. Pursuant to Ocean Plan Chapter III.M.2.e.(1)(a), the MDA Work Plan shall provide for but not be limited to:

(a) A study period of at least 12 consecutive months;

(b) A sampling program designed to account for variation in oceanographic or hydrologic conditions;

(c) Sample collection using a mesh size no larger than 335 microns;

(d) Samples identified to the lowest taxonomical level practicable; and

(e) A schedule for completion of all activities and submission of the MDA Final Report.

iv. The MDA Work Plan shall provide for consistency with the methodology described in Attachment E of the *Final Staff Report Including the Final Substitute Environmental Documentation for the Desalination Amendment to the Ocean Plan* including but not limited to larval length data, and deployment of an acoustic Doppler current profiler at each sampling location for the 12-month duration of the study.

v. The Discharger shall modify the MDA Work Plan as requested by the San Diego Water Board after consultation with other State agencies involved in the permitting of the Facility including but not limited to the State Water Board, the California Coastal Commission, the California State Lands Commission, and the California Department of Fish and Wildlife.

vi. Following the San Diego Water Board's review of the MDA Work Plan, the Discharger shall implement the MDA Work Plan in compliance with any conditions set by the San Diego Water Board in consultation with other State agencies involved in the permitting of the Facility including but not limited to the State Water Board, the California Coastal Commission, the California State Lands Commission, and the California Department of Fish and Wildlife.

vii. The MDA Final Report must be completed and submitted to the San Diego Board within two years of the effective date of this Order, unless otherwise specified by the San Diego Water Board. The MDA Final Report shall include an in-depth discussion, evaluation, interpretation, and tabulation of the data supporting the interpretations and conclusions reached. The San Diego Water Board will review and comment, as needed, on the MDA Final Report in consultation with other State agencies involved in the permitting of the Facility including but not limited to the State Water Board, the California Coastal Commission, the California State Lands Commission, and the California Department of Fish and Wildlife.

If the MDA Final Report confirms the comparability of flow augmentation and multiport diffuser brine discharge technologies, the condition on the Water Code section 13142.5(b) Determination will be of no further effect. In this case, the results of the MDA Final Report will establish the level of intake and mortality of all forms of marine life for a multiport diffuser as the benchmark for comparison to the results of the flow augmentation empirical study as required by Ocean Plan chapter III.M.2.d.(2)(c)v. If instead, the MDA Final Report fails to

confirm the San Diego Water Board's conclusion of comparability under Ocean Plan chapter III.M.2.d.(2)(c), a new Water Code section 13142.5(b) determination will be required to select an appropriate brine discharge technology for the Facility.

b. Brine Discharge Technology Empirical Study (Flow Augmentation Study)

In accordance with chapter III.M.2.d.(2)(c) of the Ocean Plan, within 180 days following the adoption of this Order, the Discharger shall submit a work plan for a study and final report designed to assess the intake and mortality of all forms of marine life associated with the flow augmentation choice of brine discharge technology, consistent with the requirements of Ocean Plan chapter III.M.2.d(2)(c)iv, *Considerations for Brine Discharge Technology*.

i. Brine Discharge Technology Empirical Study Work Plan (Work Plan)

(a) The Work Plan shall establish baseline biological conditions at the discharge location and at a reference location. At its discretion, the San Diego Water Board may allow the use of existing data to meet this requirement.

(b) The Work Plan shall provide for the collection of information, including biological surveys, to evaluate impacts caused by an augmented intake volume, intake and pump technology, water conveyance, waste brine mixing, and effluent discharge. The San Diego Water Board has the discretion to allow the Discharger to use existing data to meet portions of this requirement. Unless demonstrated otherwise, organisms entrained by the discharge technology are assumed to have a mortality of 100 percent.

(c) The Work Plan shall provide for a study period of at least 12 consecutive months following initial operation of the new intake structure unless otherwise specified by the San Diego Water Board.

(d) The Work Plan shall include a schedule for completion of all activities and submission of a Brine Discharge Empirical Study Final Report, as described in section VI.C.2.b~~a~~.iii below. The schedule must provide for submittal of the Final Report within six months of the completion of the empirical study.

(e) The Discharger shall modify the Work Plan as requested by the San Diego Water Board after consultation with other State agencies involved in the permitting of the Facility including but not limited to the State Water Board, the California Coastal Commission, the California State Lands Commission, and the California Department of Fish and Wildlife.

ii. Brine Discharge Technology Empirical Study Work Plan Implementation

The Discharger shall implement the Work Plan no later than 60 days following startup of the new intake structure, unless otherwise directed by the San Diego Water Board after consultation with other State agencies involved in the permitting of the Facility including but not limited to the State Water Board, the California Coastal Commission, the California State Lands Commission, and the California Department of Fish and Wildlife. Before implementing the Work Plan, the Discharger shall:

(a) Notify the San Diego Water Board for consultation with other State agencies involved in the permitting of the Facility including but not limited to the State Water Board, the California Coastal Commission, the California State Lands Commission, and the California Department of Fish and Wildlife of the intent to initiate the proposed actions included in the Work Plan; and

(b) Comply with any conditions set by the San Diego Water Board after consultation with other State agencies involved in the permitting of the Facility including but not limited to the State Water Board, the California Coastal Commission, the California State Lands Commission, and the California Department of Fish and Wildlife.

iii. Brine Discharge Technology Empirical Study Final Report

Within six months of completing the Brine Discharge Technology Empirical Study in accordance with the Work Plan, the Discharger shall submit a Brine Discharge Technology Empirical Study Final Report (Final Report) to the San Diego Water Board for review in consultation with other State agencies involved in the permitting of the Facility including but not limited to the State Water Board, the California Coastal Commission, the California State Lands Commission, and the California Department of Fish and Wildlife. The Final Report shall include the results of the Multiport Diffuser ~~a~~Analysis of projected marine life impacts caused by brine discharged through theoretical multiport diffusers using the Roberts Report and any other methodology described in the Work Plan. The Final Report shall include the results of the flow augmentation study. The Final Report shall also include an in-depth discussion, evaluation, interpretation, and tabulation of the data supporting the interpretations and conclusions reached.

If the Final Report shows that the flow augmentation choice for brine discharge technology results in more intake and mortality of marine life than if the Facility used ~~wastewater dilution or~~ multiport diffusers as described in Finding 31 of Attachment H.1. to this Order, then the Discharger must also submit with the Final Report a proposed schedule to either:

(a) Cease using the alternative brine discharge technology and install and use wastewater dilution or multiport diffusers to discharge brine waste; *or*

(b) Re-design the alternative brine discharge technology system to minimize intake and mortality of all forms of marine life to a level that is comparable with wastewater dilution if wastewater is available or multiport diffusers if wastewater is unavailable, subject to San Diego Water Board approval.

c. Receiving Water Violation Assessment

In the event of a violation of any receiving water limitation established within this Order, the San Diego Water Board may require the Discharger to perform a special study to investigate the nature and cause of the receiving water violation. The receiving water study shall identify measures needed to ensure future compliance with receiving water limitations. The Discharger shall submit the required study to the San Diego Water Board within 90 days of receipt of the San Diego Water Board's notification to perform a Receiving Water Violation Study.

d. Marine Life Mitigation Plan

i. No later than twelve months following the effective date of this Order, the Discharger shall prepare and submit an updated Marine Life Mitigation Plan to offset marine life and habitat impacts attributable to the construction and operation of the Facility after minimizing intake and mortality of all forms of marine life through best available site, design and technology. The updated Marine Life Mitigation Plan must establish the specific steps and methods necessary to provide 68.3 acres of mitigation to compensate for the marine life mortality impacts associated with the Facility's construction and operation. The updated Marine Life Mitigation Plan shall include the elements listed below:

(a) Project objectives, site selection, site protection instrument (the legal arrangement or instrument that will be used to ensure the long-term protection of the compensatory mitigation project site), baseline site conditions, a mitigation work plan, a maintenance plan, a long-term management plan, an adaptive management plan, performance standards and success criteria, monitoring requirements, and financial assurances.

(b) The updated Marine Life Mitigation Plan shall provide for 68.3 acres of mitigation. The Discharger may account for the previously approved 66.4 mitigation acres as credit towards meeting the mitigation requirements in accordance with Finding 62 of Attachment H.1 of this Order.

(c) The updated Marine Life Mitigation Plan shall demonstrate that the additional mitigation acreage of 1.9 acres required to implement Finding 43 of Attachment H.1 of this Order that offsets impacts from permanent stand-alone operations can be achieved through the Otay River Estuary Restoration Project (ORERP). The ORERP was provided by Poseidon to fulfill the mitigation requirements imposed by the Coastal Commission's 2007 Coastal Development Permit and the San Diego Water Board's 2009 Determination. If the ORERP is insufficient to provide the additional mitigation acreage the report shall include a plan to achieve the additional required mitigation acreage.

(d) In accordance with Finding 43 of Attachment H.1 of this Order, the San Diego Water Board's biological performance standard of fish productivity (i.e the production of new fish biomass) of 1,715.5 kg/year for the ORERP may be removed because the intrusive monitoring required to assess the biological performance standard would likely be counter-productive to the goal for the mitigation. The Discharger shall propose an alternative method for evaluating mitigation performance through comparison with appropriate reference sites.

(e) A demonstration that the updated Marine Life Mitigation Plan provides for full mitigation for the operational lifetime of the Facility to account for the temporal loss of marine life and habitat productivity during the period extending from the commencement of Facility operations that result in marine life impacts until the mitigation project meets performance standards (see Finding 53 of Attachment H.1 of this Order).

(f) A demonstration that the updated Marine Life Mitigation Plan provides for full mitigation for the interim operations of the intake pumps at a flowrate of 330 MGD from December 11, 2018 to April 30, 2020, i.e. the period extending from the date that the Encina Power Station ceased power

generating activities to the date that the new intake pumps are operational.

(g) A timetable for implementation of the updated Marine Life Mitigation Plan.

ii. The Discharger shall implement the updated Marine Life Mitigation Plan upon the plan approval by the San Diego Water Board in consultation with the State Water Board staff, the California Coastal Commission and with other agencies having authority to condition the approval of the project and require mitigation.

e. Climate Change Action Plan

Changing climate conditions may fundamentally alter the way desalination plants are designed and operated. Climate change research indicates the overarching driver of change is increased atmospheric carbon dioxide (CO_2) from human activity. The increased CO_2 emissions trigger changes to climatic patterns, which increase the intensity of sea level rise and coastal storm surges (Δ Sea Level), lead to more erratic rainfall and local weather patterns (Δ Weather Patterns), trigger a gradual warming of freshwater and ocean temperatures (Δ Water Temperature) and trigger changes to ocean water chemistry (Δ Water pH).

The Discharger is currently implementing an Energy Minimization and Green House Gas Reduction Plan (GHG Plan). In concordance with the current GHG Plan, the Discharger shall prepare and submit a Climate Change Action Plan (CCAP) within three years of the effective date of this Order. The CCAP shall identify the following:

i. Projected regional impacts on the Facility and operations due to climate change if current trends continue.

ii. Steps being taken or planned to address:

(a) Greenhouse gas emissions, directly and indirectly, attributable to the Facility operations and effluent discharge process;

(b) Flooding and sea level rise risks that may affect the operations including discharges at the Facility;

(c) Volatile rain period impacts (both dry and wet weather);

(d) Impacts on process design parameters due to changes caused by climate change; and

(e) Impacts on the Facility's operations and effluent water quality.

iii. Potential need to adjust the conditions of this Order;

iv. Financing needed to pay for planned actions;

v. Conformity with plans and requirements by other agencies, including but not limited to the California Air Resources Board, the Air Pollution Control District, and the California Coastal Commission.

vi. Schedules to update the CCAP as more information on climate change and its effects become available; and

vii. Any other factors as appropriate.

3. Best Management Practices and Pollution Prevention

a. Best Management Practices (BMP) Plan

The Discharger shall continue to maintain and implement a Best Management Practices (BMP) Plan describing site-specific plans, procedures, and practices planned or implemented to prevent or minimize, the potential for release of significant amounts of toxic or hazardous pollutants to waters of the U.S. and/or State through normal operations and ancillary activities, including, but not limited to standard operating procedures.

i. The BMP Plan shall be developed and maintained consistent with the guidance contained in the U.S. EPA *Guidance Manual for Developing Best Management Practices* (EPA 833-B-93-004). The Discharger shall routinely review all Facility components or systems (including material storage areas, plant site-runoff, in-plant transfer, process and material handling areas, loading and unloading operations, spillage or leaks, and sludge and waste disposal areas) where pollutants are used, manufactured, stored or handled to evaluate the potential for the release of significant amounts of pollutants to waters of the U.S. and/or State. Whenever the potential for a significant release of hazardous wastes or pollutants to waters of the U.S. and/or State is determined to be present, the Discharger shall identify and implement BMPs to prevent or minimize the potential for releases. Where BMPs are inadequate or absent, appropriate BMPs shall be established and implemented.

ii. The Discharger shall review the BMP Plan on an annual basis, and update the plan whenever changes at the Facility increase the potential for the discharge of toxic or hazardous pollutants to waters of the U.S. and/or State.

b. Pollutant Minimization Program

i. The Discharger must develop and conduct a Pollutant Minimization Program, in accordance with the requirements of chapter III.C.9 of the Ocean Plan, if all of the following conditions are true:

(a) The calculated effluent limitation is less than the reported Minimum Level (ML);

(b) The concentration of the pollutant is reported as Detected but Not Quantified (DNQ); and

(c) There is evidence showing that the pollutant is present in the effluent above the calculated effluent limitation.

ii. Alternatively, the Discharger must develop and conduct a Pollutant Minimization Program if all of the following conditions are true:

(a) The calculated effluent limitation is less than the Method Detection Limit (MDL);

(b) The concentration of the pollutant is reported as Not Detected (ND); and

(c) There is evidence showing that the pollutant is present in the effluent above the calculated effluent limitation.

iii. The San Diego Water Board may consider cost-effectiveness when establishing the requirements of a Pollutant Minimization Program. The program shall include actions and submittals acceptable to the San Diego Water Board including, but not limited to, the following:

(a) An annual review and semi-annual monitoring of potential sources of the reportable pollutant, which may include fish tissue monitoring and other bio-uptake sampling;

(b) Quarterly monitoring for the reportable pollutant in the influent;

(c) Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable pollutant in the effluent at or below the calculated effluent limitation;

(d) Implementation of appropriate cost-effective control measures for the pollutant, consistent with the control strategy; and,

(e) An annual status report sent to the San Diego Water Board including:

(1) All Pollutant Minimization Program monitoring results for the previous year;

(2) A list of potential sources of the reportable pollutant;

(3) A summary of all action taken in accordance with the control strategy; and

(4) A description of actions to be taken in the following year.

4. Construction, Operation and Maintenance Specifications – Not Applicable

5. Special Provisions for Publicly Owned Treatment Works – Not Applicable

6. Other Special Provisions – Not Applicable

7. Compliance Schedule for Design and Construction of the New Intake Structure

a. The Discharger shall comply with the following schedule to construct a new source water intake structure in compliance with the Ocean Plan, Water Code section 13142.5(b), and the requirements of this Order.

Table 7. Compliance Schedule for Design and Construction of the New Intake Structure

Task	Compliance Date
1. Submit to the San Diego Water Board a Construction Work Plan outlining in detail the steps and schedule with specific milestones to construct the new intake structure.	September 30, 2019
2. Complete construction and begin operation of the new dilution water intake pumps.	April 30, 2020
3. Complete 30% design of the new intake structure in conformance with the Water Code section 13142.5(b) ~~d~~Determination in Attachment H of this Order and select contractor for construction of new intake structure.	June 30, 2022
4. Secure necessary permits to construct the new intake system. This may include but is not limited to: California Coastal Commission Coastal Development Permit Amendment, and Army Corps of Engineers CWA section 404 Permit, and San Diego Water Board CWA section 401 Water Quality Certification. Additional permits or approvals may be necessary that are not listed here.	December 31, 2022
5. Begin construction of the new intake structure.	January 15, 2023

Task	Compliance Date
6. Complete Construction and begin operation of the new intake structure.	September 1, 2023
7. Achieve full compliance with the Ocean Plan, Water Code section 13142.5(b) ~~d~~Determination for the Facility, and Intake Specifications in section IV.C of this Order.	December 11, 2023

b. Compliance Schedule Reporting Requirements

The Discharger shall prepare and submit the following to the San Diego Water Board within 30 days after each compliance date specified in Table 7 of this Order:

i. A written submission detailing compliance or noncompliance with the specific schedule date and task**;**

ii. If noncompliance is being reported, the written submission shall contain a description of the noncompliance and its cause, steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance; and the anticipated time the noncompliance is expected to continue. The Discharger shall also notify the San Diego Water Board within 30 days by letter when it returns to compliance with the time schedule.

c. Interim Operations Requirements

Until the new intake structure is constructed and operational, the Discharger is required to implement the following measures to minimize the intake and mortality of all forms of marine life:

i. Surface water intakes must be screened using the existing intake screens, and the screens must be functional while the Facility is withdrawing seawater;

ii. The intake of seawater must not exceed a flowrate of 330 MGD with the existing intake pumps; and 299 MGD with the new intake pumps.

iii. Axial-flow, low-turbulence pumps shall be constructed and made operational as soon as feasible but no later than the date specified in Table 7, Task 2;

iv. The intake of seawater shall be reduced to the minimum volume necessary to maintain Facility operations and to comply with this Order, subject to the operational limitations of the existing pumps prior to the new intake pumps being operational;

v. To the maximum extent practicable, in-plant recycling of waste streams shall be maximized before intaking additional seawater;

vi. The Discharger shall cease intake of seawater except when intake of seawater is necessary to maintain Facility operations or to comply with this Order;

vii. Heat treatment of the intake system is prohibited; and

viii. Pump operations shall minimize abrupt changes in flow velocity, subject to the operational limitations of the existing pumps prior to the new intake pumps being operational.

8. Certification Report for New Intake Structure

a. Prior to beginning construction of the new intake structure and no later than July 30, 2022, the Discharger shall submit a Certification Report for the new intake structure prepared by the design engineer. The Certification Report shall:

i. Identify the design capacity of the intake structure and screening;

ii. Certify the adequacy of key components of the intake structure;

iii. Contain an analysis, based on acceptable engineering practices, for the design of the intake structure to ensure compliance with the requirements of the Ocean Plan, Water Code section 13142.5(b), Intake Specifications in section IV.C. of this Order and any other applicable requirements of this Order; and

iv. Include the supporting information and rationale for the certification include calculations, reference citations, and analysis documentation.

b. The Certification Report must be prepared by a California licensed professional engineer, competent and proficient in the field pertinent to the report and qualified to prepare such a report. A statement of qualification of the responsible lead professional shall be included in the report. The signature and engineering license number of the engineer preparing the certification report shall be affixed to the report.

c. The Discharger shall not initiate operation of the new intake structure until:

i. The Certification Report is accepted by the San Diego Water Board;

ii. The San Diego Water Board has received written notification that the intake structure is completely constructed and operable in accordance with the requirements of this Order; and

iii. The San Diego Water Board has provided the Discharger with written authorization to initiate operation of the intake structure.

9. Certification Report for New Intake Pumps

a. The Discharger shall submit a certification report for the new intake dilution pumps no later than December 31, 2019 demonstrating that the pumps comply with the criteria described in chapter III.M.2.d.(2)(d)(ii) of the Ocean Plan. The Certification Report shall:

i. Identify the make, design capacity, design criteria, and other pertinent specifications for the pumps;

ii. Contain an analysis based on acceptable engineering practices, demonstrating that the pumps are low turbulence intakes (e.g., screw centrifugal pumps or axial flow pumps), that convey and mix dilution water in a manner that limits thermal stress, osmotic stress, turbulent shear stress, and other factors (i.e. impeller blade size and configuration, revolution speed, marine life residence time) that could cause intake and mortality of all forms of marine life; and

iii. Include the supporting information and rationale for the certification including calculations, reference citations, and analysis documentation.

b. The Certification Report must be prepared by a California licensed professional engineer, competent and proficient in the field pertinent to the report and qualified to prepare the report. A statement of qualification of the responsible lead professional

shall be included in the report. The signature and engineering license number of the engineer preparing the certification report shall be affixed to the report.

c. The Discharger shall not initiate operation of the pumps until:

i. The Certification Report is accepted by the San Diego Water Board;

ii. The San Diego Water Board has received written notification that the pumps are installed and operable; and

iii. The San Diego Water Board has provided the Discharger with written authorization to initiate operation of the pumps.

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in section IV of this Order will be determined as specified below:

A. Compliance with Average Monthly Effluent Limitation (AMEL)

If the average of daily discharge monitoring results over a calendar month exceeds the AMEL for a given parameter, an alleged violation will be flagged, and the Discharger is out of compliance for each day of that month for that parameter (e.g., resulting in 31 days of noncompliance in a 31-day month). The average of daily discharge monitoring results over the calendar month that exceeds the AMEL for a parameter will be considered out of compliance for that month only. If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AMEL, the Discharger is out of compliance for that calendar month. For any one calendar month during which no sample is taken, no compliance determination in regard to the AMEL can be made for that calendar month.

B. Compliance with Average Weekly Effluent Limitation (AWEL)

If the average of daily discharge monitoring results over a calendar week (Sunday through Saturday) exceeds the AWEL for a given parameter, an alleged violation will be flagged and the Discharger is out of compliance for each day of that week for that parameter, resulting in seven days of noncompliance. The average of daily discharge monitoring results over the calendar week that exceeds the AWEL for a parameter will be considered out of compliance for that week only. If only a single sample is taken during the calendar week and the analytical result for that sample exceeds the AWEL, the Discharger is out of compliance for that calendar week. For any one calendar week during which no sample is taken, no compliance determination in regards to the AWEL can be made for that calendar week.

C. Compliance with Annual Average Effluent Limitation (AAEL)

If the average of daily discharge monitoring results over a calendar year exceeds the AAEL for a given parameter, an alleged violation will be flagged, and the Discharger is out of compliance for each day of that year for that parameter (e.g., resulting in 365 days of noncompliance in a 365-day year). The average of daily discharge monitoring results over the calendar year that exceeds the AAEL for a parameter will be considered out of compliance for that year only. If only a single sample is taken during the calendar year and the analytical result for that sample exceeds the AAEL, the Discharger is out of compliance for that calendar year. For any one calendar year during which no sample is taken, no compliance determination in regard to the AAEL can be made for that calendar year.

~~C.~~D. Compliance with Maximum Daily Effluent Limitation (MDEL)

The MDEL shall apply to flow weighted 24-hour composite samples, or grab samples, as specified in the MRP (Attachment E). If a daily discharge exceeds the MDEL for a given parameter, an alleged violation will be flagged and the Discharger is out of compliance for that parameter for that one day only within the reporting period. For any one day during which no sample is taken, no compliance determination in regards to the MDEL can be made for that day.

~~D.~~E. Compliance with Instantaneous Minimum Effluent Limitation

The instantaneous minimum effluent limitation applies to grab sample analytical results. If the analytical result of a single grab sample is lower than the instantaneous minimum effluent limitation for a parameter, an alleged violation will be flagged and the Discharger is out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within the same calendar day that are both lower than the instantaneous minimum effluent limitation results in two instances of noncompliance with the instantaneous minimum effluent limitation).

~~E.~~F. Compliance with Instantaneous Maximum Effluent Limitation

The instantaneous maximum effluent limitation applies to grab sample determinations. If the analytical result of a single grab sample is higher than the instantaneous maximum effluent limitation for a parameter, an alleged violation will be flagged and the Discharger is out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within the same calendar day that both exceed the instantaneous maximum effluent limitation results in two instances of noncompliance with the instantaneous maximum effluent limitation).

~~F.~~G. Compliance with 6-Month Median Effluent Limitation

If the median monitoring result of daily discharges over any 180-day period exceeds the 6-month median effluent limitation for a given parameter, an alleged violation will be flagged and the Discharger is out of compliance for each day of that 180-day period for that parameter. The next assessment of compliance occurs after the next sample is taken. If only a single sample is taken during a given 180-day period and the analytical result for that sample exceeds the 6-month median, the Discharger is out of compliance for the 180-day period. For any 180-day period during which no sample is taken, no compliance determination can be made for the 6-month median limitation.

~~G.~~H. Compliance with 30-Day Average Effluent Limitation

If the arithmetic mean of daily discharges over any 30 consecutive day period exceeds the 30-day average effluent limitation, an alleged violation will be flagged and the Discharger is out of compliance for each day of that 30-day period for that parameter. The next assessment of compliance will occur after the next sample is taken. If only a single sample is taken during a given 30-day period and the analytical result for that sample exceeds the 30-day average effluent limitation, the Discharger is out of compliance for the 30-day period. For any 30-day period during which no sample is taken, no compliance determination can be made for the 30-day average effluent limitation.

~~H.~~I. Mass and Concentration Limitations

Compliance with mass and concentration effluent limitations for the same parameter shall be determined separately with their respective limitations. When the concentration of a constituent in an effluent sample is determined to be ND or DNQ, the corresponding MER determined from that sample concentration shall also be reported as “ND” or “DNQ”.

~~I.~~J. Ocean Plan Provisions for Table 1 Parameters

Sufficient sampling and analysis ~~is~~ are required to determine compliance with the effluent limitations.

1. Compliance with Single-constituent Effluent Limitations

The Discharger is out of compliance with an effluent limitation or discharge specification if the monitoring result of the constituent in the sample is greater than the effluent limitation or discharge specification and is greater than or equal to the Minimum Level (ML).

2. Compliance with Effluent Limitations Expressed as a Sum of Several Parameters

The Discharger is out of compliance with an effluent limitation that applies to the sum of a group of chemicals (e.g. polychlorinated biphenyls) if the sum of the individual pollutant concentrations is greater than the effluent limitation. Individual pollutants of the group will be considered to have a concentration of zero if the constituent is reported as ND or DNQ.

3. Multiple Sample Data Reduction

The concentration of the pollutant in the effluent may be estimated from the result of a single sample analysis or by a measure of central tendency (arithmetic mean, geometric mean, median, etc.) of multiple sample analyses when all sample results are quantifiable (i.e., greater than or equal to the reported ML). When one or more sample results are reported as ND or DNQ, the central tendency concentration of the pollutant is the median (middle) value of the multiple samples. If, in an even number of samples, one or both of the middle values is ND or DNQ, the median is the lower of the two middle values.

4. Mass Emission Rate (MER)

The MER, in pounds per day, shall be obtained from the following calculation for any calendar day:

$$\text{MER (lbs/day)} = 8.34 \times Q \times C$$

Q is the flow rate in million gallons per day and C is the constituent concentration in mg/L, respectively, and 8.34 is a conversion factor (L x lbs / mg x gallons of water). If a composite sample is taken, then C is the concentration measured in the composite sample and Q is the average flow rate during the period which the samples are composited.

J. Bacterial Standards and Analysis

1. The geometric mean used for determining compliance with bacteriological standards is calculated with the following equation:

$$\text{Geometric Mean} = (C_1 \times C_2 \times \ldots \times C_n)/n$$

Where n is the number of days that samples were collected during the period and C is the density of bacteria (colony forming units (CFU)/100 mL) found on each day of sampling.

2. For all bacterial analyses, sample dilutions must be performed so the range of values extends from 2 to 16,000 CFU. The detection methods used for each analysis will be reported with the results of the analysis. Detection methods used for coliforms (total and fecal) will be those listed in 40 CFR part 136 or any improved method determined by the San Diego Water Board (and approved by U.S. EPA) to be appropriate. Detection

methods used for enterococcus shall be those presented in U.S. EPA 600/4-85/076*, Test Methods for Escherichia coli and Enterococci in Water by Membrane Filter Procedure*, listed under 40 CFR part 136, and any other method approved by the San Diego Water Board.

K. Single Operational Upset (SOU)

A SOU that leads to simultaneous violations of more than one pollutant parameter shall be treated as a single violation, and limits the Discharger's liability in accordance with the following conditions:

1. A SOU is broadly defined as a single unusual event that temporarily disrupts the usually satisfactory operation of a system in such a way that it results in violations of multiple pollutant parameters;
2. The Discharger may assert SOU to limit liability only for those violations which the Discharger submitted notice of the upset as required in section I.H of the Standard Provisions (Attachment D);
3. For purposes outside of Water Code sections 13385(h) and (i), determination of compliance and civil liability (including any more specific definition of SOU), the requirements for the Discharger to assert the SOU limitation of liability, and the manner of counting violations, shall be in accordance with the U.S. EPA Memorandum *Issuance of Guidance Interpreting Single Operational Upset* (September 27, 1989); and
4. For purposes of Water Code sections 13385(h) and (i), determination of compliance and civil liability (including any more specific definition of a SOU), the requirements for the Discharger to assert the SOU limitation of liability, and the manner of counting violations shall be in accordance with Water Code section 13385(f)(2).

L. Chronic Toxicity

The discharge is subject to determination of "Pass" or "Fail" from a chronic toxicity test using the Test of Significant Toxicity (TST) statistical t-test approach described in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (U.S. EPA 833-R-10-003, 2010), Appendix A, Figure A-1 and Table A-1, and Appendix B, Table B-1. The null hypothesis (Ho) for the TST statistical approach is:

> Mean discharge "in-stream" waste concentration (IWC) response ≤ 0.75 × Mean control response.

A test result that rejects this null hypothesis is reported as "Pass". A test result that does not reject this null hypothesis is reported as "Fail." This is a t-test (formally known as Student's t-Test), a statistical analysis comparing two sets of replicate observations - in the case of whole effluent toxicity (WET) tests, only two test concentrations (i.e., a control and IWC). In conformance with requirements contained in 40 CFR part 136, a series of five dilutions are required to be tested, while only two of the test concentrations are compared. The results from the additional dilutions tested may be used for informational purposes. The purpose of this statistical test is to determine if the means of the two sets of observations are different (i.e., if the IWC or receiving water concentration differs from the control (the test result is "Pass" or "Fail")). The Welch's t-test employed by the TST statistical approach is an adaptation of Student's t-test and is used with two samples having unequal variances.

The MDEL for chronic toxicity is exceeded and a violation will be flagged when a chronic toxicity test, analyzed using the TST statistical approach, results in "Fail" at M-002.

The MDEL for chronic toxicity is set at the IWC for the discharge (17.4% effluent[3] at M-002) and expressed in terms of the TST statistical approach ("Pass" or "Fail"). Monitoring for chronic toxicity at M-001 will be conducted as specified in the MRP, Attachment E and compared to the MDEL for informational purposes only using an IWC of 4.38% effluent for the discharge at that location. All monitoring for the chronic toxicity MDEL shall be reported using the 17.4% effluent concentration at M-002, 4.38% effluent concentration at M-001, and negative control, expressed in terms of the TST. The TST hypothesis (Ho) (see above) is statistically analyzed using the IWC and a negative control. Effluent toxicity tests shall be run using *Short-Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to West Coast Marine Estuarine Organisms* (EPA/600/R-95/136, 1995).

The San Diego Water Board's review of reported toxicity test results includes review of concentration-response patterns as appropriate (see section IV.C.6 of the Fact Sheet (Attachment F).) As described in the laboratory audit directives to the San Jose Creek Water Quality Laboratory from the State Water Board dated August 07, 2014, and from USEPA dated December 24, 2013, the Percent Minimum Significant Difference (PMSD) criteria only apply to compliance reporting for the No Observed Effect Concentration (NOEC) and the sublethal statistical endpoints of the NOEC, and therefore are not used to interpret TST results. Standard operating procedures used by the toxicity testing laboratory to identify and report valid, invalid, anomalous, or inconclusive effluent (and receiving water) toxicity test measurement results from the TST statistical approach, including those that incorporate a consideration of concentration-response patterns, must be submitted to the San Diego Water Board (40 CFR section 122.41(h)). The San Diego Water Board will make a final determination as to whether a toxicity test result is valid, and may consult with the Discharger, U.S. EPA, the State Water Board's Quality Assurance (QA) Officer, or the State Water Board's Environmental Laboratory Accreditation Program (ELAP) as needed. The Board may consider results of any Toxicity Reduction Evaluation (TRE) / Toxicity Identification Evaluation (TIE) studies when considering an enforcement action.

[3] At M-001, IWC = 1/minimum initial dilution factor (Dm) = 1/22.83 = 0.0438 = 4.38%. At M-002, IWC = 1/~~minimum initial dilution factor~~ (Dm) = 1/5.75 = 0.174 = 17.4%. Because chronic toxicity ~~is~~ sampled at M-002 is following dilution from the flow augmentation water, the only remaining dilution available is from the ocean. Therefore, the IWC for chronic toxicity at M-002 is calculated only using dilution from the ocean, 5.75 parts water (i.e. dilution ratio of 1:4.75) and not the total dilution of 22.83 parts water, (i.e. dilution ratio of 1:21.83). For further information regarding the calculation of the dilution factor, please see section II.B. of the Fact Sheet.

ATTACHMENT A – ABBREVIATIONS AND GLOSSARY

Part 1. – Abbreviations

Abbreviation	Definition
AAEL	Average Annual Effluent Limitation
AMEL	Average Monthly Effluent Limitation
APF	Area Production Foregone
ASBS	Areas of Special Biological Significance
AWEL	Average Weekly Effluent Limitation
Basin Plan	Water Quality Control Plan for the San Diego Basin
BMP	Best Management Practices
BMZ	Brine Mixing Zone
CCR	California Code of Regulations
CDP	Carlsbad Desalination Plant
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CFU	Colony Forming Units
CTD	Conductivity, Temperature, and Depth
CWA	Clean Water Act
DDT	Dichlorodiphenyltrichloroethane
DDW	Division of Drinking Water
Discharger	Poseidon Resources (Channelside) LP
Dm	Initial Dilution
DMR-QA	Discharge Monitoring Report Quality Assurance
DNQ	Detected, but Not Quantified
EIR	Environmental Impact Report
ELAP	Environmental Laboratory Accreditation Program
ETM	Empirical Transport Model
FCD	San Diego County Flood Control District
HCH	Hexachlorocyclohexane
Ho	Test Hypothesis for the Test of Significant Toxicity
IMP	Impingement Monitoring Program
IWC	Instream Waste Concentration
kg	Kilograms
lbs/day	Pounds per Day
µg	Microgram
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
ml/L	Milliliters per Liter
MDA	Multiport Diffuser Analysis
MDEL	Maximum Daily Effluent Limitation
MDL	Method Detection Limit
MEC	Maximum Effluent Concentration
MER	Mass Emission Rate
MGD	Million Gallons per Day
ML	Minimum Level
MLMP	Marine Life Mitigation Plan
MPN	Most Probable Number

Abbreviation	Definition
MRP	Monitoring and Reporting Program
MSL	Mean Sea Level
ND	Not Detected
NOEC	No Observed Effect Concentration
NR	Not Reported
NTU	Nephelometric Turbidity Unit
NPDES	National Pollutant Discharge Elimination System
Ocean Plan	California Ocean Plan, Water Quality Control Plan Ocean Waters of California
ORERP	Otay River Estuary Restoration Project
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PMP	~~Productivity Monitoring~~Pollutant Minimization Program
PMSD	Percent Minimum Significant Difference
ppt	Parts per thousand
RL	Reporting Level
ROWD	Report of Waste Discharge
RPA	Reasonable Potential Analysis
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SAP	Scien~~tific~~ce Advisory Panel
SCCWRP	Southern California Coastal Waters Research Project
SMR	Self-Monitoring Report
SOU	Single Operational Upset
State Water Board	State Water Resources Control Board
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TRE	Toxicity Reduction Evaluation
TSS	Total Suspended Solids
TST	Test of Significant Toxicity
U.S. EPA	United Stated Environmental Protection Agency
U.S.	United States
U.S.C.	United States Code
Water Code	California Water Code
WDR	Waste Discharge Requirements
WET	Whole Effluent Toxicity
ZID	Zone of Initial Dilution

Part 2. – Glossary of Common Terms

All forms of marine life
Includes all life stages of all marine species.

Area Production Foregone (APF)
Also known as habitat production foregone, is an estimate of the area that is required to produce (replace) the same amount of larvae or propagules that are removed via entrainment at a desalination facilities intake(s). APF is calculated by multiplying the proportional mortality by the source water body, which are both determined using an empirical transport model. Also known as habitat production foregone.

Areas of Special Biological Significance (ASBS)
Those areas designated by the State Water Resources Control Board (State Water Board) as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All ASBS are also classified as a subset of State Water Quality Protected Areas.

Average Annual Effluent Limitation (AAEL)
The highest allowable average of daily discharges over a calendar year, calculated as the sum of all daily discharges measured during a calendar year divided by the number of daily discharges measured during that month.

Average Monthly Effluent Limitation (AMEL)
The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL)
The highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Brine
The byproduct of desalinated water having a salinity concentration greater than a desalination facility's intake source water.

Brine mixing zone (BMZ)
The area where salinity may exceed 2.0 parts per thousand above natural background salinity, or the concentration of salinity approved as part of an alternative receiving water limitation. The standard brine mixing zone shall not exceed 100 meters (328 feet) laterally from the point(s) of discharge and throughout the water column. An alternative brine mixing zone, if approved as described in the Ocean Plan chapter III.M.3.d, shall not exceed 200 meters (656 feet) laterally from the point(s) of discharge and throughout the water column. The brine mixing zone is an allocated impact zone where there may be toxic effects on marine life due to elevated salinity.

Bypass
The intentional diversion of waste streams from any portion of a treatment facility. (40 CFR Part 122.41(m)(1)(i).)

Chlordane
The sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

Chronic toxicity
Chronic toxicity is the measure of the sub-lethal effects of a discharge or ambient water sample (e.g. reduced growth or reproduction.) Certain chronic toxicity tests include an additional measurement of lethality.

Chlorinated phenolic compounds
The sum of 4-chloro-3-methylphenol, 2-chlorophenol, pentachlorophenol, 2,4,5-trichlorophenol, and 2,4,6-trichlorophenol.

Daily discharge
Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the Order), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Degrade
Degradation shall be determined by comparison of the waste field and reference site(s) for characteristic species diversity, population density, contamination, growth anomalies, debility, or supplanting of normal species by undesirable plant and animal species. Degradation occurs if there are significant differences in any of three major biotic groups, namely, demersal fish, benthic invertebrates, or attached algae. Other groups may be evaluated where benthic species are not affected or are not the only ones affected.

Desalination facility
An industrial facility that processes water to remove salts and other components from the source water to produce water that is less saline than the source water.

Detected, but Not Quantified (DNQ)
Sample results that are less than the reported Minimum Level, but greater than or equal to the laboratory's Method Detection Limit. Sample results reported as DNQ are estimated concentrations.

Dichlorobenzenes
The sum of 1,2- and 1,3-dichlorobenzene.

Dichlorodiphenyltrichloroethane (DDT)
The sum of 4,4'DDT, 2,4'DDT, 4,4' dichlorodiphenyldichloroethylene (DDE), 2,4'DDE, 4,4' dichlorodiphenyldichloroethane (DDD), and 2,4'DDD.

Downstream ocean waters
Waters downstream with respect to ocean currents.

Dredged material
Any material excavated or dredged from the navigable waters of the U.S., including material otherwise referred to as "spoil."

Eelgrass beds
Aggregations of the aquatic plant species of the genus *Zostera*.

Empirical Transport Model (ETM)
A methodology for determining the spatial area known as the source water body that contains the source water population, which are the organisms that are at risk of entrainment as determined by factors that may include but are not limited to biological, hydrodynamic, and oceanographic data. ETM can also be used to estimate proportional mortality, P_m. Guidance for performing an ETM is available in *Appendix E of the Staff Report for 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*.

End of the discharge channel
Average seaward projection at mean sea level (MSL) of the two rock jetties that form the discharge channel.

Endosulfan
The sum of endosulfan-alpha and -beta and endosulfan sulfate.

Estuaries and coastal lagoons
Estuaries and coastal lagoons are waters at the mouths of streams that serve as mixing zones for fresh and ocean waters during a major portion of the year. Mouths of streams that are temporarily separated from the ocean by sandbars shall be considered as estuaries. Estuarine waters will generally be considered to extend from a bay or the open ocean to the upstream limit of tidal action but may be considered to extend seaward if significant mixing of fresh and salt water occurs in the open coastal waters.

ETM/APF Approach or Analysis
For guidance on how to perform an ETM/APF analysis please see *Appendix E of the Staff Report for 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*.

Facility
Claude "Bud" Lewis Carlsbad Desalination Plant.

Feasible
For the implementation of Ocean Plan section III.M, feasible shall mean capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.

Flow augmentation
A type of in-plant dilution that occurs when a desalination facility withdraws additional source water for the specific purpose of diluting brine prior to discharge.

Geometric Mean (GM)
Geometric Mean is a type of mean or average that indicates the central tendency or typical value of a set of numbers by using the product of their values (as opposed to the arithmetic mean which uses their sum). The geometric mean is defined as the nth root of the product of n numbers. The formula is expressed as: GM = $\sqrt[n]{(x_1)(x_2)(x_3)\dots(x_n)}$, where x is the sample value and n is the number of samples taken.

Halomethanes
The sum of bromoform, bromomethane (methyl bromide) and chloromethane (methyl chloride).

Hexachlorocyclohexane (HCH)
The sum of the alpha, beta, gamma (lindane) and delta isomers of HCH.

Indicator bacteria
Includes total coliform bacteria, fecal coliform bacteria (or E. coli), and/or Enterococcus bacteria.

In-kind mitigation
When the habitat or species lost is the same as what is replaced through mitigation.

Initial Dilution (Dm)
The process that results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge.

For a submerged buoyant discharge, characteristic of most municipal and industrial wastes that are released from the submarine outfalls, the momentum of the discharge and its initial buoyancy act together to produce turbulent mixing. Initial dilution in this case is completed when the diluting wastewater ceases to rise in the water column and first begins to spread horizontally.

For shallow water submerged discharges, surface discharges, and non-buoyant discharges, characteristic of cooling water wastes and some individual discharges, turbulent mixing results primarily from the momentum of discharge. Initial dilution, in these cases, is considered to be completed when the momentum induced velocity of the discharge ceases to produce significant mixing of the waste, or the diluting plume reaches a fixed distance from the discharge to be specified by the San Diego Water Board, whichever results in the lower estimate for initial dilution.

Instantaneous maximum effluent limitation
The highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous minimum effluent limitation
The lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Interference
A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

(1) Inhibits or disrupts the Facility, its treatment processes or operations, or its sludge processes, use or disposal; and

(2) Therefore is a cause of a violation of any requirement of the Facility's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Interim stand-alone operations
The Encina Power Station terminated power generation operations on December 11, 2018. At that time, the Facility initiated interim stand-alone operations utilizing the existing Encina Power Station's intake structure, screens, and existing pumps to provide the volume of seawater needed to produce potable water, and to provide dilution water for the reverse osmosis concentrate and filter backwash from the Facility prior to being discharged to the Pacific Ocean. During interim stand-alone operations the existing Encina Power Station pumps will be replaced by new intake pumps. Interim stand-alone operations continue until the permanent intake structure is constructed and operational.

Kelp beds
Kelp beds are aggregations of marine algae of the order Laminariales, including species in the genera *Macrocystis, Nereocystis,* and *Pelagophycus*. Kelp beds include the total foliage canopy throughout the water column.

Mariculture
The culture of plants and animals in marine waters independent of any pollution source.

Mitigation
Mitigation is the replacement of all forms of marine life or habitat that is lost due to the construction and operation of a desalination facility after minimizing intake and mortality of all forms of marine life through best available site, design and technology.

Material
(a) In common usage: (1) the substance or substances of which a thing is made or composed (2) substantial; (b) For purposes of the Ocean Plan relating to waste disposal, dredging and the disposal of dredged material and fill, "material" means matter of any kind or description which is subject to regulation as waste, or any material dredged from the navigable waters of the United States. See also, "Dredged Material".

Maximum Daily Effluent Limitation (MDEL)
The highest allowable daily discharge of a pollutant.

Method Detection Limit (MDL)
The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in 40 CFR part 136, Attachment B.

Minimum Level (ML)
The concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Multiport diffusers
Linear structures consisting of spaced ports or nozzles that are installed on submerged marine outfalls and enable rapid mixing, dispersal, and dilution of brine within a relatively small area.

Natural background salinity
The salinity at a location that results from naturally occurring processes and is without apparent human influence. For purposes of determining natural background salinity, the San Diego Water Board may approve the use of:

1) The mean monthly natural background salinity shall be determined by averaging 20 years of historical salinity data in the proximity of the proposed discharge location and at the depth of the proposed discharge when feasible. When historical data are not available, natural background salinity shall be determined by measuring salinity at depth of the proposed discharge for 3 years, on a weekly basis prior to a desalination facility discharging brine, and the mean monthly natural salinity shall be used to determine natural background salinity; or

2) The actual salinity at a reference location, or reference locations, that is representative of natural background salinity at the discharge location. The reference locations shall be without apparent human influence, including wastewater outfalls and brine discharges.

Either method to establish natural background salinity may be used for the purpose of determining compliance with the receiving water limitation and the effluent limitation for salinity. If a reference location(s) is used for compliance monitoring, the permit should specify that historical data shall be used if reference location data becomes unavailable. An owner or operator shall submit to the regional water board all necessary information to establish natural background salinity.

Natural light
Reduction of natural light may be determined by the San Diego Water Board by measurement of light transmissivity or total irradiance, or both, according to the monitoring needs of the San Diego Water Board.

Not Detected (ND)
Those sample results less than the laboratory's MDL.

Ocean waters
The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. If a discharge outside the territorial waters of the State could affect the quality of the waters of the State, the discharge may be regulated to assure no violation of the Ocean Plan will occur in ocean waters.

Out-of-kind mitigation
When the habitat or species lost is different than what is replaced through mitigation.

Pass through
A discharge which exits the Facility into waters of the U.S. in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the Facility's NPDES permit (including an increase in the magnitude or duration of a violation.

Phenolic Compounds (non-chlorinated)
The sum of 2,4-dimethylphenol, 4,6-Dinitro-2-methylphenol, 2,3-dinitrophenol, 2-methylphenol, 4-methylphenol, 2-nitropheneol, 4-nitrophenol, and phenol.

Pollutant Minimization Program (PMP)
PMP means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of a pollutant through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, in order to maintain the effluent concentration at or below the effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The San Diego Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to California Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements in Ocean Plan section III.C.9.

Polynuclear Aromatic Hydrocarbons (PAHs)
The sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene and pyrene.

Polychlorinated Biphenyls (PCBs)
The sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254 and Aroclor-1260.

Propagules
Structures that are capable of propagating an organism to the next stage in its life cycle via dispersal. Dispersal is the movement of individuals from their birth site to their reproductive grounds.

Proportional mortality, P_m
The percentage of larval organisms or propagules in the source water body that is expected to be entrained at a desalination facility's intake. It is assumed that all entrained larvae or propagules die as a result of entrainment.

Rehabilitation
Repair, renewal, and replacement of components to return the system to near-original condition and performance

Reported Minimum Level (also known as the Reporting Level or RL)
The reported minimum level (also known as the reporting level or RL) is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order, including an additional factor if applicable as discussed herein. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the San Diego Water Board either from Appendix II of the Ocean Plan in accordance with section III.C.5.a of the Ocean Plan, or established in accordance with section III.C.5.b of the Ocean Plan. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, the additional factor must be applied to the ML in the computation of the reported ML.

Salinity
A measure of the dissolved salts in a volume of water. Salinity shall be measured using a standard method approved by the San Diego Water Board (e.g. Standard Method 2520 B, U.S. EPA Method 120.1, U.S. EPA Method 160.1) and reported in parts per thousand. For historical salinity data not recorded in parts per thousand, the San Diego Water Board may accept converted data at their discretion.

Seawater
Salt water that is in or from the ocean. For implementation of section III.M of the Ocean Plan, seawater includes tidally influenced waters in coastal estuaries and coastal lagoons and underground salt water beneath the seafloor, beach, or other contiguous land with hydrologic connectivity to the ocean.

Sensitive habitats
Include kelp beds, rocky substrate, surfgrass beds, eelgrass beds, oyster beds, spawning grounds for State or federally managed species, market squid nurseries, or other habitats in need of special protection as determined by the San Diego Water Board.

Severe property damage
Substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 CFR section 122.41(m)(1)(ii))

Shellfish
Organisms identified by the California Department of Health Services as shellfish for public health purposes (i.e., mussels, clams, and oysters).

Significant difference
A statistically significant difference in the means of two distributions of sampling results at the 95 percent confidence level.

Single Sample Maximum (SSM)
Single Sample Maximum is a maximum value not to be exceeded in any single sample.

Six-month median effluent limitation
The highest allowable moving median of all daily discharges for any 180-day period.

Source water body
The spatial area that contains the organisms that are at risk of entrainment at a desalination facility as determined by factors that may include, but are not limited to, biological, hydrodynamic, and oceanographic data.

State Water Quality Protection Areas (SWQPAs)
Non-terrestrial marine or estuarine areas designated to protect marine species or biological communities from an undesirable alteration in natural water quality. All Areas of Special Biological Significance (ASBS) that were previously designated by the State Water Board in Resolution Nos. 74-28, 74-32, and 75-61 are now also classified as a subset of State Water Quality Protection Areas and require special protections afforded by the Ocean Plan.

Statistical Threshold Value (STV)
Statistical Threshold Value for the bacteria water quality objective is a set value that approximates the 90th percentile of the water quality distribution of a bacterial population. The STV for the bacteria water quality objective is 110 cfu/100mL as set forth in Chapter II.B.1.a. of the Ocean Plan.

Subsurface intake
For the purpose of implementing Chapter III.M of the Ocean Plan, subsurface intake is an intake withdrawing seawater from the area beneath the ocean floor or beneath the surface of the earth inland from the ocean.

Surfgrass beds
Aggregations of marine flowering plants of the genus *Phyllospadix*.

TCDD equivalents
The sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below.

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8 tetra CDF	0.1
1,2,3,7,8 penta CDF	0.05
2,3,4,7,8 penta CDF	0.5
2,3,7,8 hexa CDFs	0.1
2,3,7,8 hepta CDFs	0.01
octa CDF	0.001

Toxicity Identification Evaluation (TIE)
A set of procedures conducted to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

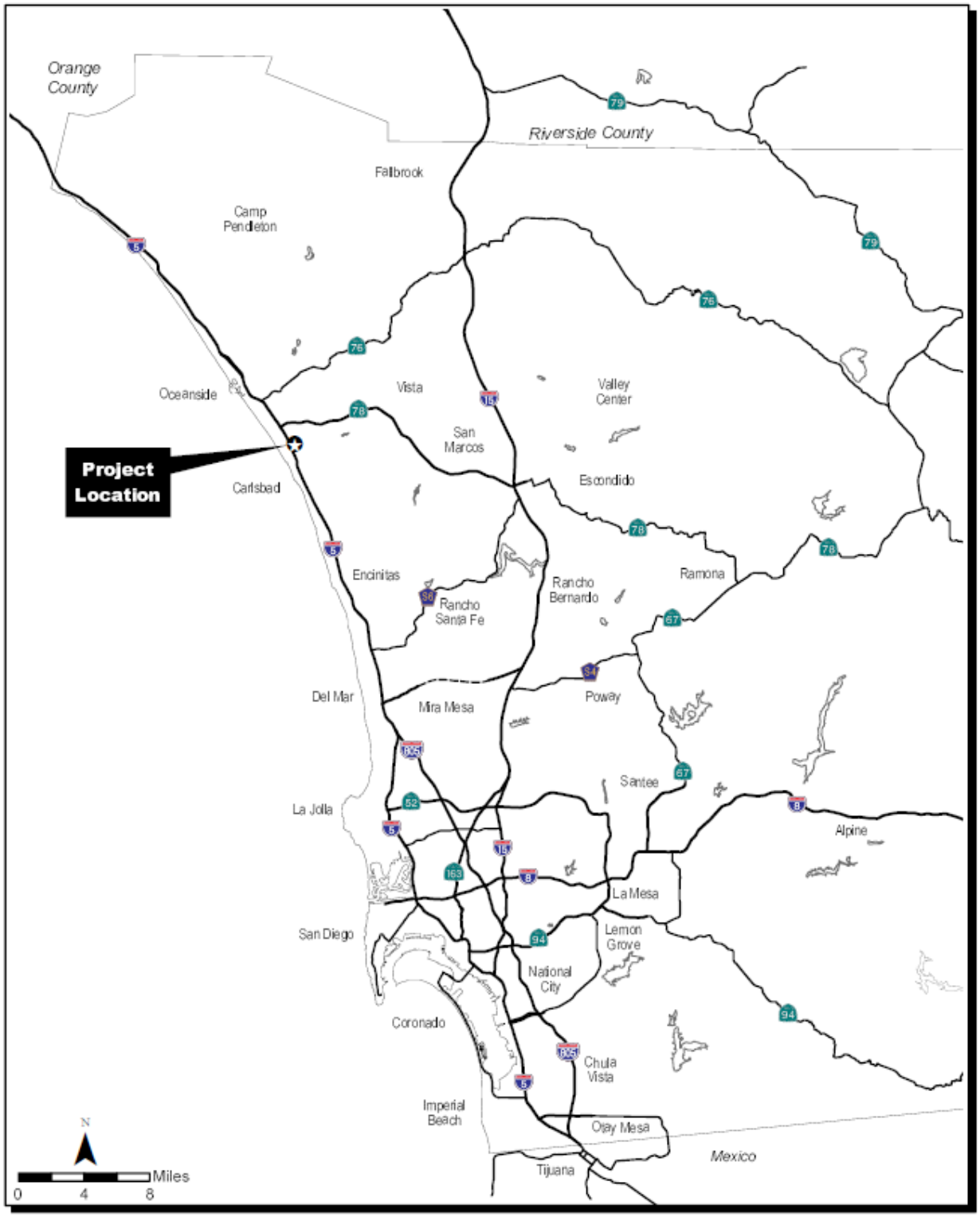
Toxicity Reduction Evaluation (TRE)
A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

Waste
As used in the Ocean Plan, waste includes a Discharger's total discharge, of whatever origin, i.e., gross, not net, discharge.

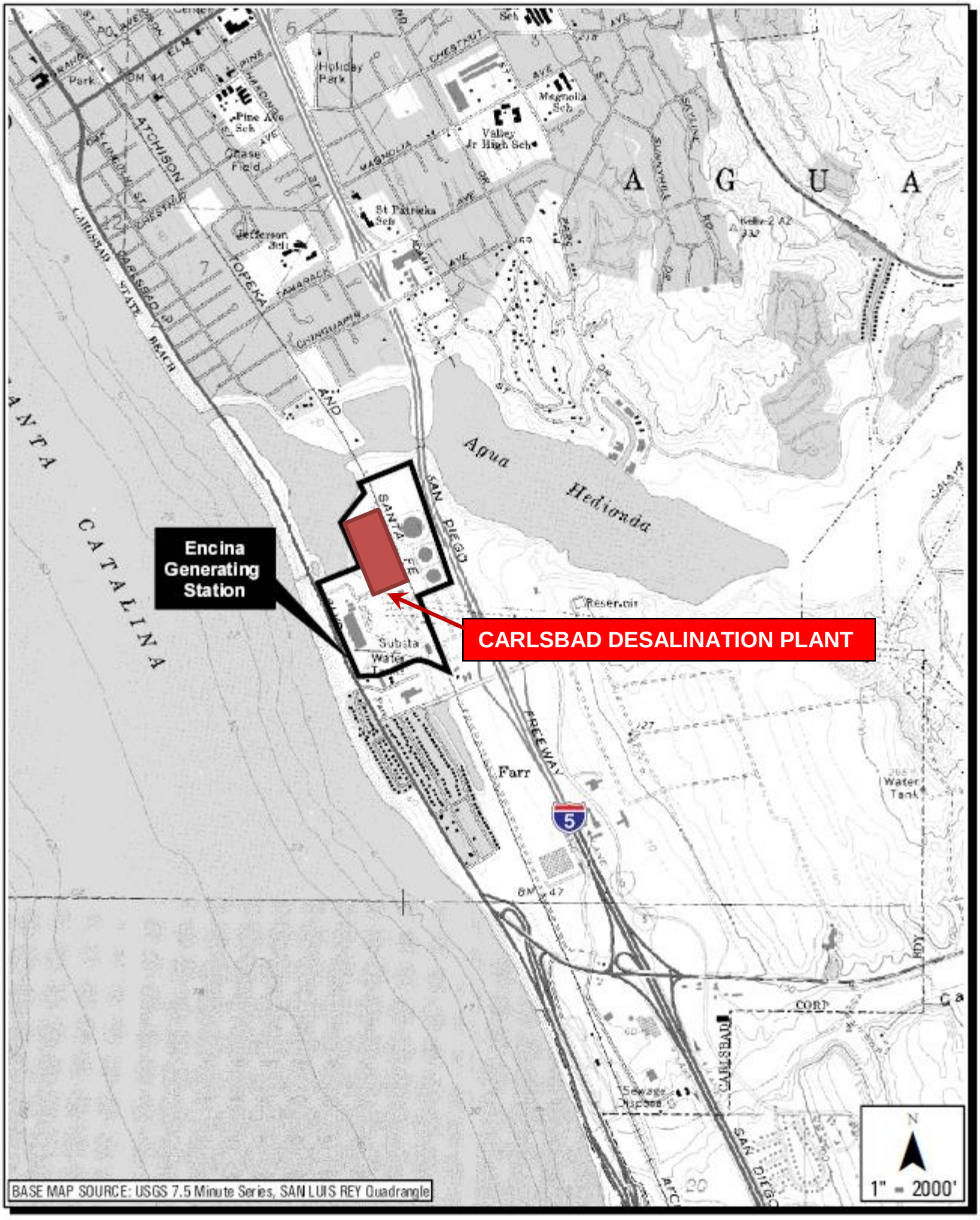
Zone of Initial Dilution
Zone of initial dilution (ZID or mixing zone) is the area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient waterbody. A ZID is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented. For the purposes of this Order the ZID and BMZ are two separately defined areas. The zone of initial dilution for this Order is set at 304.8 meters (1,000 feet) offshore of the end of the discharge channel, consistent with the prior Order No. R9-2006-0065.

ATTACHMENT B – MAPS

Map B-1. Location Map



Map B-2. Vicinity Map



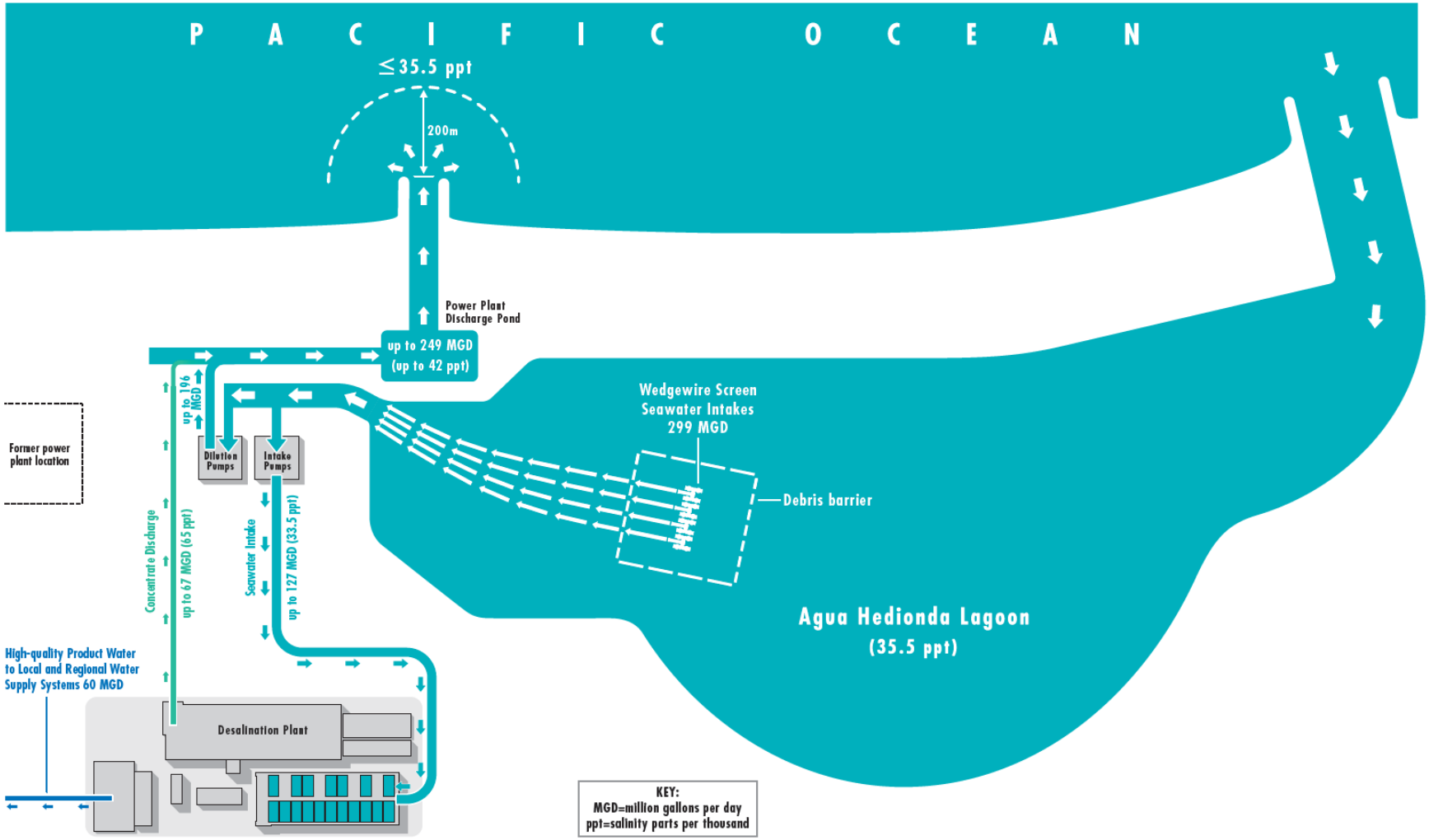
Map B-3. Surf Zone and Offshore Monitoring Locations

Poseidon Resources (Channelside) LP
Carlsbad Desalination Plant

Order No. R9-2019-0003
NPDES No. CA0109223

ATTACHMENT C – FLOW SCHEMATICS

Flow Schematic C-1. Facility Operations



ATTACHMENT D – STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the terms, requirements, and conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (Water Code) and is grounds for enforcement action; permit termination, revocation and reissuance, or modification; denial of a permit renewal application; or a combination thereof. (title 40 of the Code of Federal Regulations (40 CFR) section 122.41(a); Water Code sections 13261, 13263, 13265, 13268, 13000, 13001, 13304, 13350, 13385.)

2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. (40 CFR section 122.41(a)(1))

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. (40 CFR section 122.41(c))

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 CFR section 122.41(d))

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order. (40 CFR section 122.41(e))

E. Property Rights

1. This Order does not convey any property rights of any sort, or any exclusive privileges. (40 CFR section 122.41(g))

2. The issuance of this Order does not authorize any injury to persons or property, or invasion of other private rights, or any infringement of state or local law or regulations. (40 CFR section 122.5(c))

F. Inspection and Entry

The Discharger shall allow the San Diego Water Board, State Water Board, U.S. EPA, and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (33 United States Code (U.S.C.) section 1318(a)(4)(b); 40 CFR section 122.41(i); Water Code sections 13267, 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (33 U.S.C. section 1318(a)(4)(b)(i); 40 CFR section 122.41(i)(1); Water Code sections 13267, 13383);

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (33 U.S.C. section 1318(a)(4)(b)(ii); 40 CFR section 122.41(i)(2); Water Code sections 13267, 13383);

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (33 U.S.C. section 1318(a)(4)(b)(ii); 40 CFR section 122.41(i)(3); Water Code sections 13267, 13383); and

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (33 U.S.C. section 1318(a)(4)(b); 40 CFR section 122.41(i)(4); Water Code sections 13267, 13383)

G. Bypass

1. Definitions

a. “Bypass” means the intentional diversion of waste streams from any portion of a treatment facility. (40 CFR section 122.41(m)(1)(i))

b. “Severe property damage” means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 CFR section 122.41(m)(1)(ii))

2. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 CFR section 122.41(m)(2))

3. Prohibition of bypass. Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Discharger for bypass, unless (40 CFR section 122.41(m)(4)(i)):

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 CFR section 122.41(m)(4)(i)(A));

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance (40 CFR section 122.41(m)(4)(i)(B)); and

c. The Discharger submitted notice to the San Diego Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 CFR section 122.41(m)(4)(i)(C))

4. The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three

conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 CFR section 122.41(m)(4)(ii))

5. Notice

a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. (40 CFR section 122.41(m)(3)(i))

b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 CFR section 122.41(m)(3)(ii))

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. (40 CFR section 122.41(n)(1))

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 CFR section 122.41(n)(2))

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that (40 CFR section 122.41(n)(3)):

a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 CFR section 122.41(n)(3)(i));

b. The permitted facility was, at the time, being properly operated (40 CFR section 122.41(n)(3)(ii));

c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 CFR section 122.41(n)(3)(iii)); and

d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 CFR section 122.41(n)(3)(iv))

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 CFR section 122.41(n)(4))

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. (40 CFR section 122.41(f))

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit. (40 CFR section 122.41(b))

C. Transfers

This Order is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 CFR section 122.41(l)(3), 122.61)

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 CFR section 122.41(j)(1))

B. Monitoring must be conducted according to test procedures approved under 40 CFR part 136 for the analyses of pollutants unless another method is required under 40 CFR chapter 1, subchapters N or O. Monitoring must be conducted according to sufficiently sensitive test methods approved under 40 CFR part 136 for the analysis of pollutants or pollutant parameters or as required under 40 CFR chapter 1, subchapter N or O. For the purposes of this paragraph, a method is sufficiently sensitive when:

1. The method minimum level (ML) is at or below the level of the most stringent effluent limitation established in the permit for the measured pollutant or pollutant parameter, and either the method ML is at or below the level of the most stringent applicable water quality criterion for the measured pollutant or pollutant parameter or the method ML is above the applicable water quality criterion but the amount of the pollutant or pollutant parameter in the facility's discharge is high enough that the method detects and quantifies the level of the pollutant or pollutant parameter in the discharge; or

2. The method has the lowest ML of the analytical methods approved under 40 CFR part 136 or required under 40 CFR chapter 1, subchapter N or O for the measured pollutant or pollutant parameter.

In the case of pollutants or pollutant parameters for which there are no approved methods under 40 CFR part 136 or otherwise required under 40 CFR chapter 1, subchapters N or O, monitoring must be conducted according to a test procedure specified in this Order for such pollutants or pollutant parameters. (40 CFR sections 122.21(e)(3),122.41(j)(4), 122.44(i)(1)(iv))

IV. STANDARD PROVISIONS – RECORDS

A. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board Executive Officer at any time. (40 CFR section 122.41(j)(2))

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 CFR section 122.41(j)(3)(i));

2. The individual(s) who performed the sampling or measurements (40 CFR section 122.41(j)(3)(ii));

3. The date(s) analyses were performed (40 CFR section 122.41(j)(3)(iii));

4. The individual(s) who performed the analyses (40 CFR section 122.41(j)(3)(iv));

5. The analytical techniques or methods used (40 CFR section 122.41(j)(3)(v)); and

6. The results of such analyses. (40 CFR section 122.41(j)(3)(vi))

C. Claims of confidentiality for the following information will be denied (40 CFR section122.7(b)):

1. The name and address of any permit applicant or Discharger (40 CFR section 122.7(b)(1)); and

2. Permit applications with attachments, permits, and effluent data. (40 CFR section 122.7(b)(2))

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the San Diego Water Board, State Water Board, or U.S. EPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or U.S. EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order, or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the San Diego Water Board, State Water Board, or U.S. EPA copies of records required to be kept by this Order. (40 CFR section 122.41(h); Water Code sections 13267, 13383)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the San Diego Water Board, State Water Board, and/or U.S. EPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 CFR section 122.41(k))

2. All permit applications shall be signed by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA). (40 CFR section 122.22(a)(1))

3. All reports required by this Order and other information requested by the San Diego Water Board, State Water Board, or U.S. EPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 CFR section 122.22(b)(1));

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 CFR section 122.22(b)(2)); and

c. The written authorization is submitted to the San Diego Water Board and State Water Board. (40 CFR section 122.22(b)(3))

4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the San Diego Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 CFR section 122.22(c))

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 CFR section 122.22(d))

6. Any person providing the electronic signature for documents described in Standard Provisions – V.B.1, V.B.2, or V.B.3 that are submitted electronically shall meet all relevant requirements of Standard Provisions – Reporting V.B, and shall ensure that all relevant requirements of 40 CFR part 3 (Cross-Media Electronic Reporting) and 40 CFR part 127 (NPDES Electronic Reporting Requirements) are met for that submission. (40 CFR section 122.22(e))

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (MRP, Attachment E) in this Order. (40 CFR section 122.41(l)(4))

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board. As of December 21, 2016, all reports and forms must be submitted electronically to the initial recipient defined in Standard Provisions – Reporting V.J and comply with 40 CFR part 3, 40 CFR section 122.22, and 40 CFR part 127. (40 CFR section 122.41(l)(4)(i))

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board. (40 CFR section 122.41(l)(4)(ii))

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 CFR section 122.41(l)(4)(iii))

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date. (40 CFR section 122.41(l)(5))

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A report shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (i.e., combined sewer overflow, sanitary sewer overflow, or bypass event), type of overflow structure (e.g., manhole, combined sewer overflow outfall), discharge volume untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the event, and whether the noncompliance was related to wet weather.

2. The following shall be included as information that must be reported within 24 hours:

a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 CFR section 122.41(l)(6)(ii)(A))

b. Any upset that exceeds any effluent limitation in this Order. (40 CFR section 122.41(l)(6)(ii)(B))

3. The San Diego Water Board may waive the above required written report on a case-by-case basis if an oral report has been received within 24 hours. (40 CFR section 122.41(l)(6)(ii)(B))

F. Planned Changes

The Discharger shall give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when (40 CFR section 122.41(l)(1)):

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in part 122.29(b) (40 CFR section 122.41(l)(1)(i)); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this Order. (40 CFR section 122.41(l)(1)(ii))

G. Anticipated Noncompliance

The Discharger shall give advance notice to the San Diego Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with this Order's requirements. (40 CFR section 122.41(l)(2))

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports shall contain the information described in Standard Provision –

Reporting V.E and the applicable required data in appendix A to 40 CFR part 127. The San Diego Water Board may also require the Discharger to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section. (40 CFR section 122.41(l)(7))

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or U.S. EPA, the Discharger shall promptly submit such facts or information. (40 CFR section 122.41(l)(8))

J. Initial Recipient for Electronic Reporting Data

The owner, operator, or the duly authorized representative is required to electronically submit NPDES information specified in appendix A to 40 CFR part 127 to the initial recipient defined in 40 CFR section 127.2(b). U.S. EPA will identify and publish the list of initial recipients on its website and in the Federal Register, by state and by NPDES data group [see 40 CFR section 127.2(c)]. U.S. EPA will update and maintain this listing. (40 CFR section 122.41(l)(9))

VI. STANDARD PROVISIONS – ENFORCEMENT

A. The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the Water Code, including, but not limited to, sections 13268, 13385, 13386, and 13387.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Publicly-Owned Treatment Works (POTWs) – Not Applicable

ATTACHMENT E – MONITORING AND REPORTING PROGRAM
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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

Section 308 of the federal Clean Water Act (CWA) and sections 122.41(h), (j)-(l), 122.44(i), and 122.48 of title 40 of the Code of Federal Regulations (40 CFR) require that all National Pollutant Discharge Elimination System (NPDES) permits specify monitoring and reporting requirements. California Water Code (Water Code or CWC) sections 13267 and 13383 also authorize the San Diego Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. Pursuant to this authority this MRP establishes conditions for Poseidon Resources (Channelside) LP (Discharger) to conduct routine or episodic self-monitoring of the discharges regulated under this Order at specified influent, internal operations, effluent, and receiving water monitoring locations. The MRP requires the Discharger to report the results to the San Diego Water Board with information necessary to evaluate discharge characteristics and compliance status.

The purpose of this MRP is to determine and ensure compliance with effluent limitations and other requirements established in this Order, assess treatment efficiency, characterize effluents, and characterize the receiving water and the effects of the discharge on the receiving water. This MRP also specifies requirements concerning the proper use, maintenance, and installation of monitoring equipment and methods, and the monitoring type intervals and frequency necessary to yield data that are representative of the activities and discharges regulated under this Order.

Each monitoring section contains an introductory paragraph summarizing why the monitoring is needed and the key management questions the monitoring is designed to answer. In developing the list of key management questions, the San Diego Water Board considered four basic types of information for each question:

- *Management Information Need* – Why does the San Diego Water Board need to know the answer?
- *Monitoring Criteria* – What monitoring will be conducted for deriving an answer to the question?
- *Expected Product* – How should the answer be expressed and reported?
- *Possible Management Actions* – What actions will be potentially influenced by the answer?

The framework for this monitoring program has three components that comprise a range of spatial and temporal scales: core monitoring, regional monitoring, and special studies.

1. Core monitoring consists of the basic site-specific monitoring necessary to measure compliance with individual effluent limits and/or impacts to receiving water quality. Core monitoring is typically conducted in the immediate vicinity of the discharge by examining local scale spatial effects.

2. Regional monitoring provides information necessary to make assessments over large areas and serves to evaluate cumulative effects of all anthropogenic inputs. Regional monitoring data also assists in the interpretation of core monitoring studies.

3. Special studies are directed monitoring efforts designed in response to specific management or research questions identified through either core or regional monitoring programs. Often, they are used to help understand core or regional monitoring results where a specific environmental process is not well understood, or to address unique issues of local importance.

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in section II, Table E-1 below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the San Diego Water Board.

B. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurement is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ±5 percent from true discharge rates throughout the range of expected discharge volumes.

C. Monitoring must be conducted according to U.S. Environmental Protection Agency (U.S. EPA) test procedures approved at 40 CFR part 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act* as amended, or unless other test procedures are specified in this MRP and/or by the San Diego Water Board.

D. All analyses shall be performed in a laboratory certified to perform such analyses by the Division of Drinking Water (DDW) or a laboratory approved by the San Diego Water Board. The laboratory must be accredited under the DDW Environmental Laboratory Accreditation Program (ELAP) to ensure the quality of analytical data used for regulatory purposes to meet the requirements of this Order. Additional information on ELAP can be accessed at: http://www.waterboards.ca.gov/drinking_water/certlic/labs/ELAP-CAInformation.shtml

E. Records of monitoring information shall include information required under Standard Provisions, section IV (Attachment D).

F. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be maintained and calibrated in accordance with the manufacturer's recommendations to ensure continued accuracy of the devices.

G. The Discharger shall have, and implement, an acceptable written quality assurance (QA) plan for laboratory analyses. Duplicate chemical analyses must be conducted on a minimum of 10 percent of the samples or at least one sample per month, whichever is greater. A similar frequency shall be maintained for analyzing spiked samples. When requested by U.S. EPA or the San Diego Water Board, the Discharger shall participate in a NPDES discharge monitoring report QA performance study. The Discharger shall have a success rate equal to or greater than 80 percent.

H. Analysis for toxic pollutants, with effluent limitations or performance goals based on water quality objectives of the *Water Quality Control Plan, Ocean Waters of California, California Ocean Plan* (Ocean Plan), shall be conducted in accordance with procedures described in the Ocean Plan.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-1. Monitoring Station Locations

Monitoring Location Name	Monitoring Location Description[1]
M-INF	At a location upstream of all in-plant return flows where a representative influent sample can be obtained. This sampling location shall be relocated as necessary to provide a representative influent sample once permanent stand-alone operations (defined in section Attachment A of this Order) begin.

Monitoring Location Name	Monitoring Location Description[1]
M-001	At a location downstream of all contributing flows to the Facility effluent, prior to combining with Encina Power Station effluent or augmentation flow.
M-002	At the final effluent pond that contains combined Facility and Encina Power Station effluent, or Facility process flows and augmented dilution flows, prior to discharge to the ocean through the discharge channel.
SURF ZONE MONITORING STATIONS	
A-00	7,000 feet upcoast (northerly) of the discharge channel in the surf zone at the surface (approximately: 33° 9' 16" N, 117° 21' 8" W)
A-50	328 feet upcoast (northerly) of the discharge channel in the surf zone at the surface (approximately: 33° 8' 20" N, 117° 20' 27" W)
A-60	656 feet upcoast (northerly) of the discharge channel in the surf zone at the surface (approximately: 33° 8' 23" N, 117° 20' 28" W)
A-70	1000 feet upcoast (northerly) of the discharge channel in the surf zone at the surface (approximately: 33° 8' 27" N, 117° 20' 30" W)
A-80	328 feet downcoast (southerly) of the discharge channel in the surf zone at the surface (approximately: 33° 8' 15" N, 117° 20' 23" W)
A-90	656 feet downcoast (southerly) of the discharge channel in the surf zone at the surface (approximately: 33° 8' 12" N, 117° 20' 21" W)
A-100	1,000 feet downcoast (southerly) of the discharge channel in the surf at the surface zone (approximately: 33° 8' 9" N, 117° 20' 20" W)
OFFSHORE MONITORING STATIONS	
A-10	7,000 feet upcoast (northerly) of the discharge channel at the 10-foot depth contour (at mean lower low water (MLLW))
A-20	7,000 feet upcoast (northerly) of the discharge channel at the 20-foot depth contour (at MLLW)
A-30	7,000 feet upcoast (northerly) of the discharge channel at the 30-foot depth contour (at MLLW)
B-00 (formerly A-40)	7,000 feet upcoast (northerly) of the discharge channel, 3,400 feet offshore (approximately: 33° 8' 57" N, 117° 21' 42" W)
B-10 / D-10	Normal (west) of the discharge channel, 656 feet (200 meters) off the end of the discharge channel (approximately: 33° 8' 14" N, 117° 20' 31" W)
B-20	656 feet north, upcoast of the discharge channel, 656 feet off the end of the discharge channel (approximately: 33° 8' 19" N, 117° 20' 35" W)
B-30	656 feet south, downcoast of the discharge channel, 656 feet off the end of the discharge channel (approximately: 33° 8' 8" N, 117° 20' 28" W)
B-40	7,000 feet upcoast (northerly) of the discharge channel, 656 feet off the end of the discharge channel (approximately: 33° 9' 13" N, 117° 21' 15" W)
C-10	1,000 feet upcoast (northerly) of the discharge channel, 521 feet offshore (approximately: 33° 8' 24" N, 117° 20' 35" W)
C-20	1,000 feet upcoast (northerly) of the discharge channel, 956 feet offshore (approximately: 33° 8' 22" N, 117° 20' 39" W)
C-30	1,000 feet upcoast (northerly) of the discharge channel, 2,000 feet offshore (approximately: 33° 8' 16" N, 117° 20' 50" W)
D-10 / B-10	Normal to the discharge channel, 656 feet (200 meters) offshore (approximately: 33° 8' 14" N, 117° 20' 31" W)

Monitoring Location Name	Monitoring Location Description[1]
D-20	Normal to the discharge channel, 1,129 feet ~~offshore~~ off the end of the discharge channel (approximately: 33° 8' 11" N, 117° 20' 36" W)
D-30	Normal to the discharge channel, 1,600 feet off the end of the discharge channel~~offshore~~ (approximately: 33° 8' 8" N, 117° 20' 40" W)
D-50	Normal to the discharge channel, 2,800 feet off the end of the discharge channel~~offshore~~ (approximately: 33° 8' 1" N, 117° 20' 52" W)
E-10	1,000 feet downcoast (southerly) of the discharge channel, 652 feet offshore
E-20	1,000 feet downcoast (southerly) of the discharge channel, 1,086 feet offshore (approximately: 33° 8' 5" N, 117° 20' 26" W)
E-30	1,000 feet downcoast (southerly) of the discharge channel, 2,000 feet offshore (approximately: 33° 7' 58" N, 117° 20' 39" W)

1. Latitude and Longitude are values are approximations of the location for administrative purposes.

III. CORE MONITORING REQUIREMENTS

A. Influent Monitoring Requirements

Influent monitoring is the collection and analysis of samples or measurements of seawater prior to the desalination process. Influent monitoring of seawater withdrawn from the Agua Hedionda Lagoon prior to entering the Facility is necessary to address the following questions:

- Is the intake flow consistent with permit conditions and expectations?
- What is the concentration factor for pollutants within the effluent compared to the influent? Is this consistent with expectations considered during permit development?
- Are intake credits reasonable for future permit development efforts?

The Discharger shall monitor the influent at Monitoring Location M-INF. Influent samples shall be collected on the same day as, and shortly before the collection of effluent samples. Influent shall be monitored as follows.

Table E-2. Influent Monitoring

Parameter	Units[1]	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow[2]	MGD	Recorder/Totalizer	Continuous	--
Salinity	ppt	Grab	1/Week	[2]
Temperature	°F	Grab	1/Week	[2]

1. See Attachment A for definitions of abbreviations and a glossary of common terms used in this Order.
2. During interim operations while using the existing pumps prior to operation of the new intake pumps, the flowrate shall be calculated based on the rated flow of pumps in service.
3. As required under 40 CFR part 136.

B. Effluent Monitoring Requirements

Effluent monitoring is the collection and analysis of samples or measurements of effluents, after all treatment processes, to determine and quantify contaminants and demonstrate compliance with applicable effluent limitations, standards, and other requirements of this Order.

Effluent monitoring is necessary to address the following questions:

- Does the effluent comply with permit effluent limitations, performance goals, and other requirements of this Order, thereby ensuring that water quality standards are achieved in the receiving water?
- What is the mass of constituents that are discharged?
- Is the effluent concentration or mass loading changing over time?
- Is the Facility being properly operated and maintained to ensure compliance with the conditions of the Order?

The Discharger shall monitor the effluent at the specified monitoring location when the Facility is discharging brine as follows:

Table E-3. Effluent Monitoring when Discharging Brine

Parameter[1]	Monitoring Location	Units[2, 3]	Sample Type	Minimum Sampling Frequency
Flow[4]	M-001 & M-002	MGD	Recorder/Totalizer	Continuous[5]
Total Suspended Solids (TSS)	M-001	mg/L	Grab	1/Week
pH	M-001 & M-002	standard units	Grab	1/Week
Oil and Grease	M-001	mg/L	Grab	1/Week
Settleable Solids	M-001	ml/L	Grab	1/Week
Turbidity	M-001	NTU	Grab	1/Week
Salinity	M-001 & M-002	ppt	Grab	1/Week
Temperature	M-001	°F	Grab	1/Week
Electrical Conductivity	M-002	Deci-siemens per meter	Recorder/Totalizer	Continuous
TABLE 1 PARAMETERS FOR PROTECTION OF MARINE AQUATIC LIFE				
Arsenic, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Cadmium, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Chromium (VI)	M-001	µg/L	Grab	1/Quarter
Copper, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Lead, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Mercury, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Nickel, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Selenium, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Silver, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Zinc, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Cyanide, Total[6]	M-001	µg/L	Grab	1/Quarter
Total Chlorine Residual	M-001	µg/L	Grab	1/Quarter
Ammonia Nitrogen, Total (as N)	M-001	µg/L	Grab	1/Quarter
Phenolic Compounds (nonchlorinated)[2]	M-001	µg/L	Grab	1/Quarter
Phenolic Compounds (chlorinated)[2]	M-001	µg/L	Grab	1/Quarter
Endosulfan	M-001	µg/L	Grab	1/Quarter
Endrin	M-001	µg/L	Grab	1/Quarter
HCH[1]	M-001	µg/L	Grab	1/Quarter
Radioactivity	M-001	pCi/L	Grab	1/Quarter

Parameter[1]	Monitoring Location	Units[2, 3]	Sample Type	Minimum Sampling Frequency
TABLE 1 PARAMETERS FOR PROTECTION OF HUMAN HEALTH – NONCARCINOGENS				
Acrolein	M-001	µg/L	Grab	1/Quarter
Antimony, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Bis (2-chloroethoxy) Methane	M-001	µg/L	Grab	1/Quarter
Bis (2-chloroisopropyl) Ether	M-001	µg/L	Grab	1/Quarter
Chlorobenzene	M-001	µg/L	Grab	1/Quarter
Chromium (III)	M-001	µg/L	Grab	1/Quarter
Di-n-butyl Phthalate	M-001	µg/L	Grab	1/Quarter
Dichlorobenzenes[1]	M-001	µg/L	Grab	1/Quarter
Diethyl Phthalate	M-001	µg/L	Grab	1/Quarter
Dimethyl Phthalate	M-001	µg/L	Grab	1/Quarter
4,6-dinitro-2-methylphenol	M-001	µg/L	Grab	1/Quarter
2,4-dinitrophenol	M-001	µg/L	Grab	1/Quarter
Ethylbenzene	M-001	µg/L	Grab	1/Quarter
Fluoranthene	M-001	µg/L	Grab	1/Quarter
Hexachlorocyclopentadiene	M-001	µg/L	Grab	1/Quarter
Nitrobenzene	M-001	µg/L	Grab	1/Quarter
Thallium, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Toluene	M-001	µg/L	Grab	1/Quarter
Tributyltin	M-001	µg/L	Grab	1/Quarter
1,1,1-trichloroethane	M-001	µg/L	Grab	1/Quarter
TABLE 1 PARAMETERS FOR PROTECTION OF HUMAN HEALTH – CARCINOGENS				
Acrylonitrile	M-001	µg/L	Grab	1/Quarter
Aldrin	M-001	µg/L	Grab	1/Quarter
Benzene	M-001	µg/L	Grab	1/Quarter
Benzidine	M-001	µg/L	Grab	1/Quarter
Beryllium, Total Recoverable	M-001	µg/L	Grab	1/Quarter
Bis (2-chloroethyl) Ether	M-001	µg/L	Grab	1/Quarter
Bis (2-ethlyhexyl) Phthalate	M-001	µg/L	Grab	1/Quarter
Carbon Tetrachloride	M-001	µg/L	Grab	1/Quarter
Chlordane[1]	M-001	µg/L	Grab	1/Quarter
Chlorodibromomethane (dibromochloromethane)	M-001	µg/L	Grab	1/Quarter
Chloroform	M-001	µg/L	Grab	1/Quarter
DDT[1]	M-001	µg/L	Grab	1/Quarter
1,4-dichlorobenzene	M-001	µg/L	Grab	1/Quarter
3,3'-dichlorobenzidine	M-001	µg/L	Grab	1/Quarter
1,2-dichloroethane	M-001	µg/L	Grab	1/Quarter
1,1-dichloroethylene	M-001	µg/L	Grab	1/Quarter
Dichlorobromomethane	M-001	µg/L	Grab	1/Quarter
Dichloromethane (Methylene Chloride)	M-001	µg/L	Grab	1/Quarter
1,3-dichloropropene (1,3-Dichloropropylene)	M-001	µg/L	Grab	1/Quarter
Dieldrin	M-001	µg/L	Grab	1/Quarter
2,4-dinitrotoluene	M-001	µg/L	Grab	1/Quarter
1,2-diphenylhydrazine	M-001	µg/L	Grab	1/Quarter
Halomethanes[1]	M-001	µg/L	Grab	1/Quarter
Heptachlor	M-001	µg/L	Grab	1/Quarter

Parameter[1]	Monitoring Location	Units[2, 3]	Sample Type	Minimum Sampling Frequency
Heptachlor Epoxide	M-001	µg/L	Grab	1/Quarter
Hexachlorobenzene	M-001	µg/L	Grab	1/Quarter
Hexachlorobutadiene	M-001	µg/L	Grab	1/Quarter
Hexachloroethane	M-001	µg/L	Grab	1/Quarter
Isophorone	M-001	µg/L	Grab	1/Quarter
N-nitrosodimethylamine	M-001	µg/L	Grab	1/Quarter
N-nitrosodi-N-propylamine	M-001	µg/L	Grab	1/Quarter
N-nitrosodiphenylamine	M-001	µg/L	Grab	1/Quarter
PAHs[2]	M-001	µg/L	Grab	1/Quarter
PCBs[2]	M-001	µg/L	Grab	1/Quarter
TCDD equivalents[2]	M-001	µg/L	Grab	1/Quarter
1,1,2,2-tetrachloroethane	M-001	µg/L	Grab	1/Quarter
Tetrachloroethylene (Tetrachloroethene)	M-001	µg/L	Grab	1/Quarter
Toxaphene	M-001	µg/L	Grab	1/Quarter
Trichloroethylene (Trichloroethene)	M-001	µg/L	Grab	1/Quarter
1,1,2-trichloroethane	M-001	µg/L	Grab	1/Quarter
2,4,6-trichlorophenol	M-001	µg/L	Grab	1/Quarter
Vinyl Chloride	M-001	µg/L	Grab	1/Quarter

1 The analytical test method is as required under 40 CFR part 136.

2 See Attachment A for definitions of abbreviations and a glossary of common terms used in this Order

3 The Mass Emission Rate (MER), in lbs/day, is also reported as calculated based on the following equation: MER (lbs/day) = 8.34 x Q x C, where Q is the flow rate at the monitoring location and C is the concentration in mg/L.

4 During interim operations while using the existing pumps, the flowrate for flow augmentation dilution water shall be calculated based on the rated flow of pumps in service. Flowrates at M-001 shall be separately monitored and reported for the reverse osmosis concentrate, media filtration backwash, and total flow.

5 Report the total daily effluent flow.

6 If a Discharger can demonstrate to the satisfaction of the San Diego Water Board (subject to State Water Board and U.S. EPA approval) that an analytical method is available to reliably distinguish between strongly and weakly complexed cyanide, performance goals for cyanide may be met by the combined measurement of free cyanide, simple alkali metals cyanides, and weakly complexed organometallic cyanide complexes. In order for the analytical method to be acceptable, the recovery of free cyanide from metal complexes must be comparable to that achieved by the approved method in 40 CFR part 136, as revised May 14, 1999.

At times including but not limited to plant start-up, during or after plant maintenance, or other times when the Facility is not delivering product water to the regional water system, the Facility may temporarily discharge flows without the concentrated reverse osmosis brine. During such ~~times~~ temporary periods when the Facility is not discharging brine, monitoring is required to ensure compliance with permit provisions. The Discharger shall monitor the effluent at monitoring location M-001 when not discharging brine as follows:

Table E-4. Effluent Monitoring at M-001 when not Discharging Brine

Parameter[1]	Unit[2,3]	Sample Type	Minimum Test Frequency
Flow	MGD	Recorder/Totalizer	Continuous[4]
Total Suspended Solids	mg/L	Grab	1/Quarter
pH	Standard units	Grab	1/Quarter
Oil and Grease	mg/L	Grab	1/Quarter
Settleable Solids	ml/L	Grab	1/Quarter
Turbidity	NTU	Grab	1/Quarter

Parameter[1]	Unit[2,3]	Sample Type	Minimum Test Frequency
Flow	MGD	Recorder/Totalizer	Continuous[4]
Salinity	ppt	Grab	1/Quarter
TCDD equivalents[2]	µg/L	Grab	1/Quarter

1 The analytical test method is as required under 40 CFR part 136.
2 See Attachment A for definitions of abbreviations and a glossary of common terms used in this Order
3 The Mass Emission Rate (MER), in lbs/day, is also reported as calculated based on the following equation:
MER (lbs/day) = 8.34 x Q x C, where Q is the flow rate at the monitoring location and C is the concentration in mg/L.
4 Report the total daily effluent flow.

C. Whole Effluent Toxicity (WET) Testing Requirements

Whole Effluent Toxicity (WET) refers to the overall aggregate toxic effect of an effluent measured directly by an aquatic toxicity test(s). The control of WET is one approach this Order uses to control the discharge of toxic pollutants. WET tests evaluate the 1) aggregate toxic effects of all chemicals in the effluent including additive, synergistic, or antagonistic toxicity effects; 2) the toxicity effects of unmeasured chemicals in the effluent; and 3) variability in bioavailability of the chemicals in the effluent.

Monitoring to assess the overall toxicity of the effluent is required to answer the following questions:

- Does the effluent comply with the Order's effluent limitations for toxicity thereby ensuring that water quality standards are achieved in the receiving water?
- If the effluent does not comply with the Order's effluent limitations for toxicity, are unmeasured pollutants causing risk to aquatic life?
- If the effluent does not comply with the Order's effluent limitations for toxicity, are pollutants in combinations causing risk to aquatic life?

1. Monitoring Frequency for Chronic Toxicity

The Discharger shall conduct chronic toxicity testing on effluent samples collected at Monitoring Locations M-001 and M-002 in accordance with the following schedule and requirements:

Table E-5. Whole Effluent Toxicity Testing

Test	Unit	Sample Type	Minimum Test Frequency
Chronic Toxicity	Pass/Fail; % Effect	24-hr Composite	1/Month

The chronic instream waste concentration (IWC) is calculated by dividing 100 percent by the dilution ratio. At Monitoring Location M-001, the IWC = 1/minimum initial dilution factor (Dm) = 1/22.83 = 0.0438 = 4.38%. Because chronic toxicity ~~is~~ sampled at M-002 ~~which~~ is following dilution from the flow augmentation water, the only remaining dilution available is from the ocean. Therefore, the IWC for chronic toxicity at M-002 is calculated only using dilution from the ocean, 5.75, and not the total dilution, 22.83. For further information regarding the calculation of the dilution factor, please see section II.B. of the Fact Sheet. IWC = 1/minimum initial dilution factor (Dm) = 1/5.75 = 0.174 = 17.4%. The "in-stream" waste concentration (IWC) for this discharge is 17.4 percent effluent at M-002.

2. Sample Volume and Holding Time

The total sample volume is determined by the specific toxicity test method used. Sufficient sample volume must be collected to perform the required toxicity test. Sufficient sample volume shall also be collected during accelerated monitoring for subsequent Toxicity Identification Evaluation (TIE) studies, if necessary, at each sampling event. All toxicity tests shall be conducted as soon as possible following sample collection. No more than 36 hours shall elapse before the conclusion of sample collection and test initiation.

3. Chronic Marine Species and Test Methods

Chronic toxicity testing shall be performed using species and test methods outlined in *Short-Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to West Coast Marine Estuarine Organisms* (EPA/600/R-95/136) or *Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project* (State Water Board, 1996).

Table E-6. Approved Tests for Chronic Toxicity

Species	Test	Tier [1]	Reference[2]
Giant Kelp, *Macrocystis pyrifera*	percent germination; germ tube length	1st	a, c
Red Abalone, *Haliotis rufescens*	abnormal shell development	1st	a, c
Oyster, *Crassostrea gigas*; or Mussels*, Mytilus spp*.	abnormal shell development; percent survival	1st	a, c
Urchin, *Strongylocentrotus purpuratus*; or Sand Dollar, *Dendraster excentricus*	percent normal development	1st	a, c
Urchin, *Strongylocentrotus purpuratus*; or Sand Dollar, *Dendraster excentricus*	percent fertilization	1st	a, c
Mysid Shrimp, *Holmesimysis costata*	percent survival; growth	1st	a, c
Mysid Shrimp, *Mysidopsis bahia*	percent survival; fecundity	2nd	b, d
Topsmelt, *Atherinops affinis*	larval growth rate; percent survival	1st	a, c
Silversides, *Menidia beryllina*	larval growth rate; percent survival	2nd	b, d

1 First tier methods are preferred for compliance monitoring. If first tier organisms are not available, the Discharger can use a second tier test method following approval by the San Diego Water Board.

2 Protocol References:

a. Chapman, G.A., D.L. Denton, and J.M. Lazorchak. 1995. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*. U.S. EPA Report No. EPA/600/R-95/136.

b. Klemm, D.J., G.E. Morrison, T.J. Norberg-King, W.J. Peltier, and M.A. Heber. 1994. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms*. U.S. EPA Report No. EPA-600-4-91-003.

c. SWRCB 1996. *Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project.* 96-1WQ.

d. Weber, C.I., W.B. Horning, I.I., D.J. Klemm, T.W. Nieheisel, P.A. Lewis, E.L. Robinson, J. Menkedick and F. Kessler 9eds). 1998. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*. EPA/600/4-87/028. National Information Service, Springfield, VA.

4. Species Sensitivity Screening

Species sensitivity screening shall be conducted during this Order's first required sample collection after the effective date of this Order, or within 24 months of the most recent screening, whichever is later. The Discharger shall collect a single effluent sample to

initiate and concurrently conduct three toxicity tests using a vertebrate, an invertebrate, and an alga species referenced in Table E-6. This sample shall also be analyzed for the parameters required on a monthly or more frequency for the discharge, during that given month. If the result of all three species is "Pass" then the species that exhibits the highest "Percent Effect" at the discharge IWC during species sensitivity screening shall be used for routine monitoring. If only one species fails, then that species shall be used for routine monitoring. Likewise, if two or more species result in "Fail" then the species that exhibits the highest "Percent Effect" at the discharge IWC during the suite of species sensitivity screening shall be used for routine monitoring.

Species sensitivity rescreening is required every 24 months. The Discharger shall rescreen with the vertebrate, invertebrate, and alga species previously referenced, and continue to monitor with the most sensitive species. If the first suite of rescreening tests demonstrates that the same species is the most sensitive then the rescreening does not need to include more than one suit of tests. If a different species is the most sensitive or if there is ambiguity, then the Discharger shall proceed with suites of screening tests for a minimum of three, but not to exceed five suites.

The species used to conduct the routine toxicity monitoring shall be the most sensitive species from the most recent species sensitivity screening. During the calendar month, toxicity tests used to determine the most sensitive test species shall be reported as effluent compliance monitoring results for the chronic toxicity maximum daily effluent limitation (MDEL).

Dilution and control water shall be uncontaminated natural seawater obtained from an unaffected area of the receiving waters or laboratory water prepared and used as specified in the test methods manual. The sensitivity of wild-caught/outdoor-reared test organisms to a reference toxicant must be determined concurrently with each toxicity test and reported with test results. Monthly reference toxicant testing is sufficient for laboratory-cultured organisms.

5. Quality Assurance (QA) and Additional Requirements

Quality assurance (QA) measures, instructions, and other recommendations and requirements are found in the test methods manual previously referenced. Additional requirements are specified below.

a. The discharge is subject to determination of "Pass" or "Fail" from a chronic toxicity test using the Test of Significant Toxicity (TST) statistical t-test approach described in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, 2010), Appendix A, Figure A-1 and Table A-1 and Appendix B, Table B-1. The null hypothesis (Ho) for the TST statistical approach is:

Ho: Mean discharge IWC response ≤ 0.75 × Mean control response.

A test result that rejects this null hypothesis is reported as "Pass". A test result that does not reject this null hypothesis is reported as "Fail". This is a t-test (formally Student's t-Test), a statistical analysis comparing two sets of replicate observations—in the case of WET, only two test concentrations (i.e., a control and IWC). In conformance with requirements contained in 40 CFR part 136, a series of five dilutions are required to be tested, while only two of the test concentrations are compared. The results from the additional dilutions tested may be used for informational purposes. The purpose of this statistical test is to determine if the

means of the two sets of observations are different (i.e., if the IWC or receiving water concentration differs from the control; the test result is "Pass" or "Fail"). The Welch's t-test employed by the TST statistical approach is an adaptation of Student's t-test and is used with two samples having unequal variances. The relative "Percent Effect", for reporting purposes, at the discharge IWC is defined and reported as:

$$\% \text{ Effect at IWC} = \frac{(\text{Mean control response} - \text{Mean discharge IWC response})}{\text{Mean control response}} \times 100$$

b. The MDEL for chronic toxicity is exceeded and a violation will be flagged when a toxicity test during routine monitoring results in "Fail" in accordance with the TST approach.

c. If the effluent toxicity test does not meet all test acceptability criteria (TAC) specified in the referenced test method, *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms)* (EPA/600/R-95/136), the test should be declared invalid, then the Discharger must resample and re-test within 14 days of test termination.

d. Dilution water and control water, including brine controls, shall be uncontaminated natural seawater obtained from an unaffected area of the receiving waters or laboratory water prepared and used as specified in the test methods manual. If dilution water and control water is different from test organism culture water, then a second control using culture water shall also be used.

e. Monthly reference toxicant testing is sufficient for laboratory-cultured organisms. All reference toxicant test results should be reviewed and reported using the effects concentration at 50 percent (EC50).

f. The Discharger shall perform toxicity tests on final effluent samples. If the effluent is chlorinated and discharged without further treatment, then chlorine shall not be removed from the effluent sample prior to toxicity testing without written approval by the San Diego Water Board. However, ammonia shall not be removed from the effluent sample prior to toxicity testing, unless explicitly authorized under this section of this MRP and the rationale is explained in the Fact Sheet (Attachment F).

6. Preparation of an Initial Investigation Toxicity Reduction Evaluation (TRE) Work Plan

The Discharger shall update and submit their Initial Investigation TRE Work Plan within 90 days of the effective date of this Order. The TRE Work Plan shall be subject to the approval of the San Diego Water Board and shall be modified as directed by the San Diego Water Board. If the San Diego Water Board does not disapprove of the work plan within 60 days, the work plan shall become effective. The Discharger shall use *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluation (*EPA/600/2-88/070) and other relevant U.S. EPA guidance manuals, or the most current version. This TRE Work Plan shall describe the steps that the Discharger intends to follow if toxicity is detected, and shall include at a minimum:

a. A description of the investigation and evaluation techniques that will be used to identify potential causes and sources of toxicity, effluent variability, and treatment system efficiency;

b. A description of the Discharger's methods of maximizing in-house treatment efficiency and good housekeeping practices, and a list of all chemicals used in the operation of the Facility; and,

c. If a TIE is necessary, the name and title of the individual responsible for conducting the TIE (i.e., an in-house expert or an outside contractor).

7. Accelerated Monitoring Schedule for Maximum Daily Single Result: "Fail"

The Maximum Daily single result shall be used to determine if accelerated testing needs to be conducted. If the Maximum Daily single result exceeds the MDEL, the Discharger shall notify the San Diego Water Board and implement the accelerated monitoring schedule within five calendar days of becoming aware of this result. However, if the sample is contracted out to a commercial laboratory, the Discharger shall ensure that the San Diego Water Board is notified and the first of four accelerated monitoring tests is initiated within five calendar days of the Discharger becoming aware of the result.

The accelerated monitoring schedule shall consist of four toxicity tests, conducted at approximately two-week intervals, over an eight-week period, in preparation for the TRE process and associated reporting. If each of the accelerated toxicity tests results in "Pass," the Discharger shall return to routine monitoring for the next monitoring period. If one of the accelerated toxicity tests results in "Fail," the Discharger shall immediately implement the TRE Process conditions set forth below. During accelerated monitoring schedules, only TST results ("Pass" or "Fail") for chronic toxicity tests shall be reported as effluent compliance monitoring and effluent informational monitoring results for the chronic toxicity MDEL.

8. TRE Process

During the TRE Process, monthly effluent monitoring shall resume and TST results ("Pass" or "Fail" and "Percent Effect") for chronic toxicity tests shall be reported as effluent compliance monitoring results at M-002 and effluent informational monitoring results at M-001 for the chronic toxicity MDEL.

a. Preparation and Implementation of Specific TRE Work Plan. The Discharger shall immediately initiate a TRE using, according to the type of treatment facility, U.S. EPA manual *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations* (EPA/600/2-88/070, 1989) and, within 15 days of receiving validated results, submit to the San Diego Water Board a Specific TRE Work Plan, which shall follow the Initial Investigation TRE Work Plan revised as appropriate for this toxicity event. It shall include the following information, and comply with additional conditions set by the San Diego Water Board:

i. Further actions by the Discharger to investigate, identify, and correct the causes of toxicity;

ii. Actions the Discharger will take to mitigate the effects of the discharge and prevent the recurrence of toxicity; and

iii. A schedule for these actions, progress reports, and the final report.

b. The Discharger may initiate a TIE as part of a TRE to identify the causes of toxicity using the same species and test method and, as guidance, U.S. EPA manuals: *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures* (EPA/600/6-91/003, 1991); *Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080, 1993); *Methods*

for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity (EPA/600/R-92/081, 1993); and *Marine Toxicity Identification Evaluation (TIE): Phase I Guidance Document* (EPA/600/R-96-054, 1996). The TIE should be conducted on the species demonstrating the most sensitive toxicity response.

c. Many recommended TRE elements are parallel to required or recommended efforts for source control, pollution prevention, and storm water control programs. TRE efforts should be coordinated with such efforts. As toxic substances are identified or characterized, the Discharger shall continue the TRE by determining the sources of toxicity and evaluating strategies for reducing or eliminating the substances from the discharge. All reasonable steps shall be taken to reduce toxicity to levels consistent with toxicity evaluation parameters.

d. The Discharger shall continue to conduct routine effluent monitoring for compliance determination purposes at M-002 and informational purposes at M-001 while the TRE and/or TIE process is taking place. Additional accelerated monitoring and TRE Work Plans are not required once a TRE is begun.

e. The San Diego Water Board recognizes that toxicity may be episodic and identification of causes and reduction of sources of toxicity may not be successful in all cases. The TRE may be ended at any stage if routine monitoring finds there is no longer toxicity.

f. The San Diego Water Board may consider the results of any TRE/TIE studies in an enforcement action.

9. Toxicity Reporting

The self-monitoring report (SMR) shall include a full laboratory report for each toxicity test. This report shall be prepared using the format and content of the test methods manual chapter titled “Report Preparation”, and shall include:

a. The valid toxicity test results for the TST statistical approach, reported as “Pass” or “Fail” and “Percent Effect” at the chronic toxicity IWC for the discharge. All toxicity test results (whether identified as valid or otherwise) conducted during the calendar month shall be reported on the SMR due date specified in Table E-11.

b. Summary water quality measurements for each toxicity test (e.g., pH, dissolved oxygen, temperature, conductivity, hardness, salinity, chlorine, ammonia).

c. The statistical analysis used in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, 2010) Appendix A, Figure A-1 and Table A-1, and Appendix B, Table B-1.

d. TRE/TIE results. The San Diego Water Board shall be notified no later than 30 days from completion of each aspect of the TRE/TIE analyses. Prior to the completion of the final TRE/TIE report, the Discharger shall provide status updates in the monthly monitoring reports, indicating which TRE/TIE steps are underway, which steps have been completed, and the estimated time to completion of the final TRE/TIE report. The final TRE/TIE report shall be submitted to the San Diego Water Board within 30 days of report completion.

e. Statistical program (e.g., TST calculator, CETIS, etc.) output results, including graphical plots, for each toxicity test.

f. Graphical plots clearly showing the laboratory’s performance for the reference toxicant for the previous 20 tests and the laboratory’s performance for the control

mean, control standard deviation, and control coefficient of variation for the previous 12-month period.

g. Any additional quality assurance/quality control (QA/QC) documentation or any additional chronic toxicity-related information, upon written request from the San Diego Water Board.

D. Land Discharge Monitoring Requirements – Not Applicable

E. Recycling Monitoring Requirements – Not Applicable

IV. RECEIVING WATER MONITORING REQUIREMENTS

The receiving water and sediment monitoring requirements set forth below are designed to measure the effects of the Facility's discharge on the receiving ocean waters, including potential effects on coastal water quality and marine life. The overall receiving water monitoring program is intended to answer the following questions:

- Does the receiving water meet water quality standards?
- Are the receiving water conditions getting better or worse over time?
- What is the relative contribution of the Facility's discharge to pollution in the receiving water?
- What are the effects of the discharge on the receiving waters?

Receiving water and sediment monitoring shall be conducted as specified below. This program is intended to document conditions within the brine mixing zone (BMZ) and the zone of initial dilution (ZID), at reference stations, and at areas beyond the ZID where discharge impacts might be reasonably expected. Station location, sampling, sample preservation, and analyses, when not specified, shall be by methods approved by the San Diego Water Board. The monitoring program may be modified by the San Diego Water Board at any time. The Discharger may also submit a list with rationale for any proposed changes to these monitoring requirements that the Discharger considers to be appropriate to the San Diego Water Board for approval.

During monitoring events, sample stations shall be located using a land-based microwave positioning system or a satellite positioning system such as a global positioning system. If an alternate navigation system is proposed, its accuracy shall be compared to that of microwave and satellite-based systems, and any compromises in accuracy shall be justified.

A. Surf Zone Water Quality Monitoring Requirements

As ocean surface waves come closer to shore they break, forming the foamy, bubbly surface called surf. The region of breaking waves defines the surf zone.

Monitoring of the surf zone is intended to answer the following questions:

- Does the effluent cause or contribute to an exceedance of the water quality standards in the receiving water?

Surf zone stations (listed in Table E-1) shall be monitored as follows:

Table E-7. Surf Zone Monitoring Requirements

Parameter	Units	Sample Type	Sampling Stations	Sampling Frequency
Visual Observations	--	Visual	A-00 and A-50 through A-100	[1]
Temperature	°F	Grab	A-00 and A-50 through A-100	1/Quarter
pH	s.u.	Grab	A-00 and A-50 through A-100	1/Quarter

Dissolved Oxygen	mg/L	Grab	A-00 and A-50 through A-100	1/Quarter
Salinity	ppt	Grab	A-00 and A-50 through A-100	1/Quarter

[1] Visual observations of the surface water conditions at the designated receiving water stations shall be conducted in such a manner as to enable the observer to describe and report the presence, if any, of floatables. Observations of wind (direction and speed), weather (cloudy, sunny, or rainy), direction of current, tidal conditions (high or low), water color, discoloration, oil and grease, turbidity, and odor shall be recorded. These observations shall be taken whenever a sample is collected. Visual observations shall also be conducted for repeat sampling.

1. **Sample Station Omission Due to Storm Condition.** In the event of stormy weather which makes sampling hazardous at certain surf zone stations, collection of samples at such stations can be omitted, provided that such omissions do not occur more than five times in any calendar year or occur at consecutive sampling times. The visual observations listed in footnote no. 1 to Table E-7 shall still be recorded and reported to the San Diego Water Board in the quarterly and semiannual reports. If practicable, an effort should be made to return to the sampling station that was omitted and collect the sample during calmer conditions within the same reporting period.

B. Offshore Water Quality Monitoring Requirements

Offshore monitoring is necessary to answer the following questions:

- Does the discharge cause an increase in salinity of >2.0 ppt above ambient conditions?
- Is the wastewater plume adversely impacting receiving water areas used for swimming, surfing, diving, and shellfish harvesting?
- Is natural light significantly reduced at any point outside the ZID as a result of the discharge?
- Does the discharge cause a discoloration of the ocean surface?
- Does the discharge of oxygen demanding waste cause the dissolved oxygen concentration to be depressed at any time more than 10 percent from that which occurs naturally?
- Does the discharge of waste cause the pH to change at any time more than 0.2 units from that which occurs naturally?
- What is the fate of the discharge plume?

Offshore receiving water monitoring shall be conducted at the offshore monitoring stations (listed in Table E-1) as follows:

Table E-8. Offshore Monitoring Requirements

Parameter	Units	Sampling Stations	Sample Type	Sampling Frequency
Visual Observations[1]	--	A-00, B-00, B-10 through B-40, C-10 through C-30, D-10 through D-50, E-10 through E-30	Visual	1/Quarter
Salinity	ppt	A-00, A-50 through A-90, B-00, B-10 through B-40, C-10 through C-30, D-10 through D-50, E-10 through E-30	Continuous Profile[2]	1/Quarter
Temperature	°F	A-00, B-00, B-10 through B-40, C-10 through C-30, D-10 through D-50, E-10 through E-30	Continuous Profile[2]	1/Quarter

pH	s.u.	A-00, B-00, B-10 through B-40, C-10 through C-30, D-10 through D-50, E-10 through E-30	Continuous Profile[2]	1/Quarter
Dissolved Oxygen	mg/L	A-00, B-00, B-10 through B-40, C-10 through C-30, D-10 through D-50, E-10 through E-30	Continuous Profile[2]	1/Quarter
Light Transmittance	Percent	A-10 through A-30, B-00 through B-40, C-10 through C-30, D-10 through D-50, E-10 through E-30	Continuous Profile[2]	1/Quarter

[1] Visual observations of the surface water conditions at the designated receiving water stations shall be conducted in such a manner as to enable the observer to describe and report the presence, if any, of floatables. Observations of wind (direction and speed), weather (cloudy, sunny, or rainy), direction of current, tidal conditions (high or low), water color, oil and grease, turbidity, and odor shall be recorded. These observations shall be taken whenever a sample is collected.

[2] Temperature, depth, salinity, dissolved oxygen, light transmittance, and pH profile data shall be measured throughout the entire water column using a conductivity, temperature, and depth (CTD) profiler during the quarterly sampling events. Depth profile measurements shall be obtained using multiple sensors to measure parameters through the entire water column (from the surface to as close to the bottom as practicable) evaluated at one-foot intervals.

C. Benthic Monitoring Requirements

Seafloor sediments integrate constituents that are discharged to the ocean. Most particles that come from the Facility's discharge, and any associated contaminants, will eventually settle to the seafloor where they are incorporated into the existing sediments. Sediments can accumulate these particles over the years until the point where sediment quality is degraded and beneficial uses are impaired.

Benthic organisms are strongly affected by sediment contaminant exposure because these organisms often live in continual direct contact with sediment/pore water, and many species ingest significant quantities of sediment as a source of nutrition. Because the benthos are dependent on their surroundings, they serve as a biological indicator that reflects the overall conditions of the aquatic environment. Seafloor sediment monitoring is intended to answer the following questions:

- Is the concentration of substances set forth in Table 1 of the Ocean Plan, for the protection of marine aquatic life in marine sediments, at levels which would degrade the benthic community?
- Is the concentration of organic pollutants in marine sediments at levels that would degrade the benthic community?
- Are benthic communities degraded as a result of the discharge?
- Is the sediment quality changing over time?

The assessment of sediment quality to evaluate potential effects of the Facility discharge and compliance with narrative water quality standards specified in the Ocean Plan consist of the measurement and integration of three lines of evidence: 1) physical and chemical properties of seafloor sediments, 2) seafloor sediment toxicity to assess bioavailability and toxicity of sediment contaminants, and 3) ecological status of the biological communities (benthos) that live in or on the seafloor sediments.

1. Sediment Assessment for Physical and Chemical Properties

a. Sediment Sampling Stations and Monitoring Frequency. The sediment monitoring program is designed to assess spatial and temporal trends in sediment quality and to assess benthic habitat condition in terms of physical and chemical

composition (e.g., grain-size distribution, sediment chemistry). Sediment samples for assessment of sediment chemistry shall be collected on an ~~bi~~annual basis at the monitoring stations specified in the Benthic Monitoring Work Plan required in section IV.C.4 below.

b. Sediment Sample Collection Methods. Sediment samples shall be taken using a 0.1-square meter modified Van Veen grab sampler. Samples for grain-size and chemical analyses shall be taken from the top two centimeters of the surface sediment. Sediment samples for physical and chemical properties shall be taken concurrently with and adjacent to (as much as possible) the sediment samples for benthic community condition. Bulk sediment chemical analysis shall include at a minimum the set of constituents listed in Table E-9 below.

c. Sediment Chemistry Test Methods. Sediment chemistry is the measurement of the concentration of chemicals of concern in sediments. The chemistry line of evidence is used to assess the potential overall exposure risk to benthic organisms from pollutants in surficial sediments. Chemical analysis of sediment shall be conducted using USEPA approved methods, methods developed by the National Oceanic and Atmospheric Administration's (NOAA's) National Status and Trends for Marine Environmental Quality, or methods developed in conjunction with the Southern California Bight Regional Monitoring Program. For chemical analysis of sediment, samples shall be reported on a dry weight basis.

d. Sediment monitoring for physical and chemical properties shall be conducted at monitoring stations specified in the Benthic Monitoring Work Plan as follows:

Table E-9. Sediment Monitoring Requirements

Parameter	Units	Type of Sample	Sampling Frequency
Acid Volatile Sulfides	Milligram/kilogram (mg/kg)	Grab	1 / Year~~1 / Two Years~~
Total Organic Carbon	percent	Grab	1 / Year~~1 / Two Years~~
Total Chlorinated Hydrocarbons	mg/kg	Grab	1 / Year~~1 / Two Years~~
Particle Size Distribution	micrometer (µm)	Grab	1 / Year~~1 / Two Years~~
Arsenic	mg/kg	Grab	1 / Year~~1 / Two Years~~
Cadmium	mg/kg	Grab	1 / Year~~1 / Two Years~~
Total Chromium	mg/kg	Grab	1 / Year~~1 / Two Years~~
Copper	mg/kg	Grab	1 / Year~~1 / Two Years~~
Lead	mg/kg	Grab	1 / Year~~1 / Two Years~~
Mercury	mg/kg	Grab	1 / Year~~1 / Two Years~~
Nickel	mg/kg	Grab	1 / Year~~1 / Two Years~~
Silver	mg/kg	Grab	1 / Year~~1 / Two Years~~
Zinc	mg/kg	Grab	1 / Year~~1 / Two Years~~
Cyanide	mg/kg	Grab	1 / Year~~1 / Two Years~~
Phenolic Compounds	mg/kg	Grab	1 / Year~~1 / Two Years~~
PCBs	ng/kg	Grab	1 / Year~~1 / Two Years~~
2,4-DDD	ng/kg	Grab	1 / Year~~1 / Two Years~~
4,4-DDD	ng/kg	Grab	1 / Year~~1 / Two Years~~
2,4-DDE	ng/kg	Grab	1 / Year~~1 / Two Years~~
4,4-DDE	ng/kg	Grab	1 / Year~~1 / Two Years~~
2,4-DDT	ng/kg	Grab	1 / Year~~1 / Two Years~~
4,4-DDT	ng/kg	Grab	1 / Year~~1 / Two Years~~
Aldrin	ng/kg	Grab	1 / Year~~1 / Two Years~~

Parameter	Units	Type of Sample	Sampling Frequency
Alpha-Chlordane	ng/kg	Grab	1 / Year~~1 / Two Years~~
Dieldrin	ng/kg	Grab	1 / Year~~1 / Two Years~~
Endosulfan	ng/kg	Grab	1 / Year~~1 / Two Years~~
Endrin	ng/kg	Grab	1 / Year~~1 / Two Years~~
Gamma-BHC	ng/kg	Grab	1 / Year~~1 / Two Years~~
Heptachlor	ng/kg	Grab	1 / Year~~1 / Two Years~~
Heptachlor Epoxide	ng/kg	Grab	1 / Year~~1 / Two Years~~
Hexachlorobenzene	ng/kg	Grab	1 / Year~~1 / Two Years~~
Mirex	ng/kg	Grab	1 / Year~~1 / Two Years~~
Trans-Nonachlor	ng/kg	Grab	1 / Year~~1 / Two Years~~
Acenapthene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Acenaphthylene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Anthracene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Benzo(a)anthracene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Benzo(o)fluoranthene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Benzo(k)fluoranthene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Benzo(ghi)pyrelene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Benzo(a)pyrene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Benzo(e)pyrene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Biphenyl	µg/kg	Grab	1 / Year~~1 / Two Years~~
Chrysene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Dibenz(ah)anthraces	µg/kg	Grab	1 / Year~~1 / Two Years~~
Fluoranthene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Fluorene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Ideno(123cd)pyrene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Naphthalene	µg/kg	Grab	1 / Year~~1 / Two Years~~
1-Methylnaphthalene	µg/kg	Grab	1 / Year~~1 / Two Years~~
2-Methylnaphthalene	µg/kg	Grab	1 / Year~~1 / Two Years~~
2,6-Dimethylnaphthalene	µg/kg	Grab	1 / Year~~1 / Two Years~~
2,3,5-Trimethylnaphthale	µg/kg	Grab	1 / Year~~1 / Two Years~~
Perylene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Phenanthrene	µg/kg	Grab	1 / Year~~1 / Two Years~~
1-Methylphenanthene	µg/kg	Grab	1 / Year~~1 / Two Years~~
Pyrene	µg/kg	Grab	1 / Year~~1 / Two Years~~

2. Sediment Toxicity

a. Toxicity Sampling Stations and Frequency. Sediment toxicity is a measure of the response of invertebrates exposed to surficial sediments under controlled laboratory conditions. The sediment toxicity line of evidence is used to assess both pollutant-related biological effects and exposure. Sediment samples for assessment of toxicity shall be monitored every other year at the monitoring stations specified in the Sediment Monitoring Work Plan.

b. Sediment Toxicity Collection Methods. Sediment samples shall be taken using a 0.1-square meter modified Van Veen grab sampler. Samples for toxicity analyses shall be taken from the top two centimeters of the surface sediment. Sediment samples for toxicity shall be taken concurrently with and adjacent to (as much as possible) the sediment samples for physical and chemical properties, and benthic community condition.

c. Sediment Toxicity Test Methods. Sediment toxicity tests shall utilize alternative amphipod species (Eohaustorius estuaries, Leptocheirus plumulosus, Rhepoxynius abronius) and be conducted in accordance with EPA 600/R-94/0925 (USEPA, 1994), Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, and the Southern California Bight Project sediment toxicity testing guidelines (Bight'13 Toxicology Committee, 2013)[1]. Response criteria shall include mortality, emergence from sediment during exposure, and ability to rebury in clean sediment at the end of the 10-day exposure period. Results shall be reported as "pass"/"fail" and percent response.

d. Data Analysis. Analysis of sediment toxicity shall include a calculation of the mean control normalized response.

3. Benthic Community Condition

a. Benthic Community Sampling Stations and Frequency. Samples for assessment of benthic community structure shall be collected every other year at monitoring stations specified in the Benthic Monitoring Work Plan. One sample per station shall be collected for analysis of benthic community structure. Monitoring shall be conducted as follows:

Table E-10. Infauna Monitoring Requirements

Parameter	Units	Sample Type	Sampling Frequency
Benthic Biota	Identification and enumeration	Grab	1 / Two Years

b. Benthic Community Sample Collection Methods. Benthic community samples shall be collected using the guidance specified in the most recent field manual developed for the Southern California Bight Regional Monitoring Program[2]. The benthic samples shall be collected using a 0.1-square meter modified Van Veen grab sampler. These grab samples shall be separate from (but adjacent to as much as possible) samples collected for sediment grain-size and chemistry. Benthic community samples shall be processed in accordance with the most recent Macrobenthic (Infaunal) Sample Analysis Laboratory Manual developed for the Southern California Bight Regional Monitoring Program[3]. The samples shall be sieved using a 1.0-millimeter mesh screen. The benthic organisms retained on the sieve shall be fixed in 10 percent buffered formalin~~,~~ and transferred to at least 70 percent ethanol within two to five days of storage. All benthic invertebrates in the screened sample shall be identified to the lowest possible taxon, enumerated (counted), measured, and, where feasible, assessed for reproductive condition.

c. Benthic Community Analysis. Analysis of benthic community structure shall include determination of the number of species, number of individuals per species, and total numerical abundance present. The following parameters or metrics shall be calculated for each 0.1-square meter grab sample and summarized by station, as appropriate:

[1] The Southern California Bight Project's Toxicology Laboratory Manual is located at this website as of November 29, 2018: http://www.sccwrp.org/Documents/BightDocuments/Bight18Documents/Bight18PlanningDocuments.aspx

[2] The most recent field manual for the Southern California Bight Regional Monitoring Program as of November 29, 2018 is located at this website: http://ftp.sccwrp.org/pub/download/DOCUMENTS/BightPlanningDocuments/Bight13/B13_Field_Manual.pdf

[3] The most recent Macrobenthic (Infaunal) Sample Analysis Laboratory Manual developed for the Southern California Bight Regional Monitoring Program as of November 29, 2018 is located at this website: http://ftp.sccwrp.org/pub/download/DOCUMENTS/BightPlanningDocuments/Bight13/B13_BenthicLabManual.pdf

i. Number of species;

ii. Total numerical abundance;

iii. Benthic Response Index (BRI);

iv. Swartz's 75 percent dominance index;

v. Shannon-Weiner's diversity index (H); and

vi. Pielou evenness index (J)

4. Benthic Monitoring Work Plan

The Discharger shall submit to the San Diego Water Board within 180 days after the effective date of this Order, a Benthic Monitoring Work Plan to implement the ongoing benthic monitoring program in section IV.C.1 through 3 above. The Work Plan shall include the following elements:

a. A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols;

b. Protocols for sediment sample collection and processing;

c. Proposed methods for analyzing sediment data and integrating the three lines of evidence (i.e., sediment physical and chemical properties, sediment toxicity, and benthic community condition);

d. Proposed triad monitoring station locations that are spatially representative of the sediment within the discharge field of influence and designated through a conceptual model that identifies the physical and chemical factors that control the fate and transport of pollutants and receptors that could be exposed to pollutants in the water and sediment including but not limited to 1) points of discharge; 2) tidal flows and predominant currents; 3) historic or legacy conditions; 4) nearby land and marine uses; 5) beneficial uses; 6) potential receptors of concern; 7) changes in sediment grain size, salinity, water depth, and organic matter; and 8) other sources or discharges in the immediate vicinity; and

e. Schedule for completion of sample collection and submission of the results. Benthic (sediment quality) monitoring shall occur on a biannual basis.

The Discharger shall implement the Benthic Monitoring Work Plan sixty (60) days after submission of the Work Plan, unless otherwise directed in writing by the San Diego Water Board. The Discharger shall modify the Work Plan as necessary to comply with any conditions set by the San Diego Water Board.

D. Receiving Water Monitoring Report

1. Receiving Water Monitoring Report. The Discharger shall submit receiving water monitoring reports to the San Diego Water Board annually.

a. The Receiving Water Monitoring Report shall cover the following requirements:

i. Surf Zone and Offshore Water Quality (sections IV.A and IV.B of this MRP);

ii. Sediment assessment for physical and chemistry properties (section IV.C.1 of this MRP and required on a biannual basis);

iii. Sediment assessment for toxicity (section IV.C.2 of this MRP and required on a biannual basis);

iv. Benthic community condition (section IV.C.3 of this MRP and required on a biannual basis); and

v. Sediment data analysis integrating the three lines of evidence (i.e., sediment physical and chemical properties, sediment toxicity, and benthic community condition) (section IV.C.4 of this MRP and required on a biannual basis).

b. The Receiving Water Monitoring Report shall include, as a minimum, the following information

i. A description of climatic and receiving water characteristics at the time of sampling (weather observations, floating debris, discoloration, wind speed and direction, swell or wave action, time of sampling, tide height, etc.);

ii. A description of sampling stations, including, if such information is available, differences unique to each station (e.g., station location, sediment grain size, distribution of bottom sediments, rocks, shell litter, calcareous worm tubes, etc.);

iii. A description of the sample collection and preservation procedures used in the survey;

iv. A description of the specific method used for laboratory analysis;

v. An in-depth discussion, evaluation (e.g., detailed statistical analyses), interpretation and tabulation of the data including interpretations and conclusions as to whether applicable receiving water limitations in this Order have been attained at each station; and

vi. An in-depth discussion addressing the questions proposed in each section of the Receiving Water Monitoring Requirements of this MRP.

2. State of the Ocean Report. The Discharger shall present an oral report to the San Diego Water Board summarizing the conclusions of the receiving water monitoring report. The State of the Ocean Report shall be given once no later than 180 days prior to the expiration date of this Order. If an oral report cannot be scheduled for a San Diego Water Board meeting, the San Diego Water Board may approve submission of a written State of the Ocean Report. The State of the Ocean Report shall include, at minimum, the following elements:

a. Description of the monitoring effort completed;

b. The status and trends of receiving water quality conditions; and

c. Plans for future monitoring efforts.

V. REGIONAL MONITORING REQUIREMENTS

Regional ocean water monitoring provides information about the sources, fates, and effects of anthropogenic contaminants in the coastal marine environment necessary to make assessments over large areas. The large-scale assessments provided by regional monitoring describe and evaluate cumulative effects of all anthropogenic inputs and enable better decision making regarding protection of beneficial uses of ocean waters. Regional monitoring data assists in the interpretation of core monitoring studies by providing a more accurate and complete characterization of reference conditions and natural variability. Regional monitoring also leads to methods standardization and improved quality control through inter-calibration exercise. The coalitions implementing regional monitoring enable sharing of technical resources, trained personnel, and associated costs. Focusing these resources on regional issues and developing a

broader understanding of pollutants effects in ocean waters enables the development of more rapid and effective response strategies. Based on all of these considerations the San Diego Water Board supports regional approaches to monitoring ocean waters.

The Discharger shall, as directed by the San Diego Water Board, participate with other regulated entities, other interested parties, and the San Diego Water Board in development and implementation of new and improved monitoring and assessment programs for ocean waters in the San Diego Region and discharges to those waters. These programs shall be developed and implemented so as to answer the following questions:

(1) What are the status and trends of conditions in ocean waters in the San Diego Region with regard to beneficial uses? For example:

   a. Are fish and shellfish safe to eat?

   b. Is water quality safe for swimming?

   c. Are ecosystems healthy?

(2) What are the primary stressors causing or contributing to conditions of concern?

(3) What are the major sources of the stressors causing or contributing to conditions of concern?

(4) Are the actions taken to address such stressors and sources effective (i.e., environmental outcomes)?

Development and implementation of new and improved monitoring and assessment programs for ocean waters will be guided by the following:

1. The Ocean Plan;
2. San Diego Water Board Resolution No. R9-2012-0069, *Resolution in Support of A Regional Monitoring Framework*;
3. San Diego Water Board staff report entitled *A Framework for Monitoring and Assessment in the San Diego Region*; and
4. Other guidance materials, as appropriate.

A. Kelp Bed Canopy Monitoring Participation Requirements

Kelp consists of a number of species of brown algae. Along the central and southern California coast, giant kelp (*Macrocystis pyrifera*) is the largest species colonizing rocky, and in some cases sandy, subtidal habitats. Giant kelp is an important component of coastal and island communities in southern California, providing food and habitat for numerous animals.

Monitoring of the kelp beds is necessary to answer the following questions:

- What is the maximum areal extent of the coastal kelp bed canopies each year?
- What is the variability of the coastal kelp bed canopy over time?
- Are coastal kelp beds disappearing? If yes, what are factors that could contribute to the disappearance?
- Are new coastal kelp beds forming? If yes, what are factors that could contribute to new kelp beds forming?

The Discharger shall participate with other southern California ocean dischargers in an annual regional survey of coastal kelp beds in the Southern California Bight. The intent of these surveys is to provide an indication of the health of these kelp beds, recognizing that the extent of kelp bed canopies may change due to a variety of influences.

Kelp beds shall be monitored by means of vertical aerial infrared photography to determine the maximum areal extent of the canopies of coastal kelp beds each year. Surveys shall be conducted as close as possible to when kelp bed canopies are at their greatest extent during the year. The entire San Diego Region coastline, from the international boundary to the San Diego Region/Santa Ana Region boundary shall be photographed on the same day.

The maximum areal extent of kelp bed canopies each year shall be compared to that observed in previous years. Any significant losses that persist for more than one year shall be investigated by divers to document benthic and understory conditions.

Annually on October 1, the Discharger shall submit to the San Diego Water Board a copy of the regional report which summarizes the data, analyses, assessment, and images produced by the surveys. The report is a joint collaboration among a few multiple ocean dischargers in the Southern California (e.g., Region 9 Kelp Survey Consortium member agencies). In addition to the kelp bed canopies, the images shall show onshore reference points, locations of all ocean outfalls and diffusers, artificial reefs, areas of known hard-bottom substrate (i.e., rocky reefs), and depth contours at intervals of 30-feet mean lower low water (MLLW). The report shall also be made available in a user-friendly format on a website that is readily available to the public.

The surveys shall be conducted on a "continuous improvement" basis, i.e., each year improvements shall be made in monitoring, analysis, assessment, and/or documentation. For example, these could include:

1. More sophisticated analysis of patterns, correlations, and cycles that may be related to the extent of kelp bed canopies; or
2. Projects to improve understanding of influences on kelp beds or of how the extent of the canopies of various kelp beds has changed since the early 20th century.

B. Southern California Bight Monitoring Program Participation Requirements

The Discharger is required to participate in the Southern California Bight Regional Monitoring Program coordinated by the Southern California Coastal Water Research Project (SCCWRP), or any other coordinator named by the San Diego Water Board, pursuant to Water Code sections 13267, 13383, and 40 CFR section 122.48. The intent of the Southern California Bight Regional Monitoring Program is to maximize the efforts of all monitoring partners using a more cost-effective monitoring design and to best utilize the pooled scientific resources of the Southern California Bight.

During these coordinated sampling efforts, the Discharger's receiving water sampling and analytical effort, as defined in section IV of this MRP, may be reallocated to provide a regional assessment of the impact of the discharge of ~~municipal~~ wastewater to the Southern California Bight. In that event, the San Diego Water Board shall notify the Discharger in writing that the request to perform the receiving water sampling and analytical effort defined in section IV of this MRP is suspended for the duration of the reallocation. Anticipated modifications to the monitoring program will be coordinated so as to provide a more comprehensive picture of the ecological and statistical significance of monitoring results and to determine cumulative impacts of various pollution sources. The level of resources in terms of sampling and analytical effort redirected from the receiving water monitoring program required under section IV of this MRP shall approximately equal the level of resources provided to implement the regional monitoring and assessment program, unless the San Diego Water Board and the Discharger agree otherwise. The specific scope and duration of the receiving water monitoring program reallocation and redirection shall be determined in writing by the San

Diego Water Board in consultation with the Discharger.

VI. OTHER MONITORING REQUIREMENTS

A. Discharger Monitoring Report Quality Assurance (DMR-QA).

When requested by U.S. EPA or the San Diego Water Board, the Discharger will participate in the NPDES DMR-QA performance study. If the DMR-QA is not required the Discharger shall submit the most recent Water Pollution Performance Evaluation Study. The Discharger shall ensure that the results of the DMR-QA Study or the most recent Water Pollution Performance Evaluation Study are submitted annually by December 31 to the State Water Resources Control Board at the following address:

State Water Resources Control Board Quality Assurance Program Officer
Office of Information Management and Analysis
State Water Resources Control Board
1001 I Street, Sacramento, CA 95814

VII. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D of this Order) related to monitoring, reporting, and recordkeeping.
2. The Discharger shall report all instances of noncompliance not reported under Attachment D, Sections V.E, V.G, and V.H, of this Order at the time monitoring reports are submitted. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to be taken that will reduce, eliminate, and prevent reoccurrence of the noncompliance.

B. Self-Monitoring Report (SMR) Submittal

1. The Discharger shall electronically submit SMRs using the State Water Board's California Integrated Water Quality System (CIWQS) Program website at http://www.waterboards.ca.gov/water_issues/programs/ciwqs/. The CIWQS website will provide additional information for SMR submittal in the event there will be a planned service interruption for electronic submittal. The SMRs shall be signed and certified in accordance with the standard provisions in Attachment D. The Discharger shall maintain sufficient staffing and resources to ensure that SMRs are complete and timely submitted. This includes provision for training and supervision of individuals on how to prepare and submit SMRs.
2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through VI. The Discharger shall submit monthly, quarterly, semiannual, and annual SMRs including the results of all required monitoring using U.S. EPA approved test methods or other test methods specified in this Order. SMRs are to include all new monitoring results obtained since the last SMR was submitted. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.
3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-11. Monitoring Periods and Reporting Schedule

Sampling Frequency/ Report Type	Monitoring Period Begins	Monitoring Period	SMR Due Date
Continuous	First day of the calendar month following the permit effective date or on permit effective date if that date is first day of the month.	All	First day of second calendar month following month of sampling.
1/Day	First day of the calendar month following the permit effective date or on permit effective date if that date is first day of the month.	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	First day of second calendar month following month of sampling.
1/Week	First Sunday of the calendar month following the permit effective date or on permit effective date if that date is on the first Sunday of the calendar month.	Sunday through Saturday	First day of second calendar month following month of sampling.
1/Month	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month.	First day of calendar month through last day of calendar month	First day of second calendar month following month of sampling.
1/Quarter	Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date.	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	May 1 August 1 November 1 February 1
Semi-Annual	Closest of January 1 or July 1, following (or on) permit effective date.	January 1 through June 30 July 1 through December 31	August 1 February 1
Annual Receiving Water Monitoring Report[1]	January 1 following (or on) permit effective date.	January 1 through December 31	July 1
Biannual Benthic Monitoring Report	January 1 following (or on) permit effective date.	January 1 through December 31 of the following year	July 1

[1] The Annual receiving water monitoring report shall include the benthic monitoring requirements (section IV.C of Attachment E of this Order) for that year if sampled and an assessment of all receiving water monitoring data.

4. Reporting Protocols. The Discharger shall report with each sample result the applicable reported Minimum Level (ML, also known as the Reporting Level, or RL) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR part 136.

The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

b. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ. The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.

5. Compliance Determination. Compliance with effluent limitations for reportable pollutants shall be determined using sample reporting protocols defined above and in section VII of this Order. For purposes of reporting and administrative enforcement by the San Diego Water Board and State Water Board, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the reportable pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported ML.

6. Multiple Sample Data. When determining compliance with a measure of central tendency (arithmetic mean, geometric mean, median, etc.) of multiple sample analyses and the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND), the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

a. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

7. The Discharger shall submit SMRs in accordance with the following requirements:

a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the Facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify alleged violations of the Order; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

C. Discharge Monitoring Reports (DMRs)

DMRs are U.S. EPA reporting requirements. The Discharger shall electronically certify and submit DMRs together with SMRs using Electronic Self-Monitoring Reports module eSMR 2.5 or any upgraded version. Electronic DMR submittal shall be in addition to electronic SMR submittal. Information about electronic DMR submittal is available at this website: http://www.waterboards.ca.gov/water_issues/programs/discharge_monitoring

D. Other Reports

The following reports are required under Special Provisions (section VI.C), Attachment E, and the California Code of Regulations (CCR) and shall be submitted to the San Diego Water Board, signed and certified as required by the Standard Provisions (Attachment D):

Table E-12. Other Reports

Report	Location of requirement	Due Date
Multiport Diffuser Analysis Work Plan	Section VI.C.2.a of Order	180 days following the effective date of the Order
Multiport Diffuser Analysis	Section VI.C.2.a of Order	2 years following the effective date of the Order, unless otherwise specified
Brine Discharge Technology Empirical Study Work Plan	Section VI.C.2.b~~a~~ of Order	180 days following adoption of the Order
Report of Waste Discharge (for reissuance)	Section VI.A.5 of Order	180 days before the Order expiration date
Results of any TRE Evaluation	Section III.C.9.d of Attachment E	Within 30 days of completion of the TRE
Brine Discharge Technology Empirical Study Final Study Report	Section VI.C.2.b.iii~~.d~~ of Order	6 months following completion of the Brine Discharge Technology Empirical Study Work Plan
Climate Change Action Plan	Section VI.C.2.e~~d~~ of Order	3 years after the effective date of the Order
Updated Marine Life Mitigation Plan	Section VI.C.2.d~~c~~ of Order	12 months after the effective date of the Order
Final Compliance Schedule Report	Section VI.C.7.b of Order	30 days after achieving full compliance with the Ocean Plan and Water Code section 13142.5(b) ~~d~~Determination
New Intake Structure Certification Report	Section VI.C.8.a of Order	July 30, 2022
New Intake Pumps Certification Report	Section VI.C.9.a of Order	December 31, 2019
Benthic Monitoring Work Plan	Section IV.C.4 of Attachment E	180 days after the effective date of the Order
Toxicity Reduction Evaluation (TRE) Work Plan	Section III.C.6 of Attachment E	90 days after the effective date of this Order

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in section II.B of the Order, the San Diego Water Board incorporates this Fact Sheet as findings of the San Diego Water Board supporting the issuance of this Order. This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California. Only those sections or subsections of this Order that are specifically identified as "Not Applicable" have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as "Not Applicable" are fully applicable to this Discharger.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the Facility.

Table F-1. Facility Information

WDID	9 000001429		
Discharger	Poseidon Resources (Channelside) LP		
Name of Facility	Claude "Bud" Lewis Carlsbad Desalination Plant		
Facility Address	4590 Carlsbad Boulevard Carlsbad, CA 92008 San Diego County		
Facility Contact, Title and Phone	Peter M. MacLaggan, Vice President, (760) 655-3900		
Authorized Person to Sign and Submit Reports	Same as above		
Mailing Address	5780 Fleet Street, Suite 140 Carlsbad, CA 92008		
Billing Address	Same as mailing address		
Type of Facility	Water Supply (Desalination Plant)		
Major or Minor Facility	Major		
Threat to Water Quality	2[1]		
Complexity	B[2]		
Facility Permitted Flow at Monitoring Location M-001	**Wastewater**	**Maximum Daily Flowrate (MGD)[3]**	**Annual Average Flowrate (MGD)**
	Media Filtration Backwash	~~7~~ --	7
	Reverse Osmosis Concentrate	~~60~~ --	60
	Combined Discharge of Media Filtration Backwash and Reverse Osmosis Concentrate	67	--
Facility Permitted/Design Flow at Monitoring Location M-002	330 MGD with existing intake pumps; 299 MGD with new intake pumps		
Watershed	Pacific Ocean		
Receiving Water	Pacific Ocean		
Receiving Water Type	Ocean waters		

1. As defined by California Code of Regulations, title 23, division 3, chapter 9, Waste Discharge Reports and Requirements, article 1 Fees –Threat to Water Quality Category 2 is "those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.

2. *Ibid*, Complexity Category B is defined to be "Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management unit.
3. Startup maintenance flows, product water, and off-spec water may be temporarily discharged to the Pacific Ocean during initial plant start-up, during or after plant maintenance, or at other times when the Facility is otherwise not delivering potable water to the regional water system. Temporarily discharging such water to the Pacific Ocean does not constitute a "bypass" as defined in Attachment A, and Attachment D, Standard Provision I.G.1.a of this Order. All limits and requirements, including monitoring, specified in this Order remain applicable during these temporary discharges.

D. The Claude "Bud" Lewis Carlsbad Desalination Plant (Facility) is a seawater desalination plant located on the shores of Agua Hedionda Lagoon (also referred to as Lagoon) in Carlsbad, CA. The Facility currently produces up to 54 million gallons per day (MGD) of potable drinking water for the San Diego County Water Authority (SDCWA). Poseidon Resources (Channelside) LP's (Poseidon or Discharger) is the current owner and operator of the Facility. However, the SDCWA has the option to purchase the Facility from Poseidon starting December 23, 2025.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

E. The Facility was formerly co-located with the Encina Power Station, owned and operated by Cabrillo Power I LLC. The discharge from the Encina Power Station to the Pacific Ocean is regulated separately under Order No. R9-2006-0043, NPDES No. CA0001350.The Encina Power Station ceased power generating operations on December 11, 2018.

F. The Discharger was previously regulated by Order No. R9-2006-0065, as amended by Order Nos. R9-2009-0038 and R9-2010-0073, National Pollutant Discharge Elimination System (NPDES) Permit No. CA0109223, adopted on June 14, 2006 and expired on October 1, 2011. Regulations at title 40 of the Code of Federal Regulations (40 CFR) section 122.46 limit the duration of NPDES permits to a fixed term not to exceed five years. In accordance with 40 CFR section 122.6 and the State's regulations at title 23, division 3, chapter 9, article 3, section 2235.4 of the California Code of Regulations (CCR), the term of the existing Order was administratively extended and continued in effect after the permit expiration date until the adoption of this Order (Order No. R9-2019-0003). Accordingly, Table 3 of this Order limits the duration of the discharge authorization. However, pursuant to CCR, title 23, section 2235.4, the terms and conditions of an expired permit are automatically continued pending reissuance of the Order if the Discharger complies with all federal NPDES requirements for continuation of expired permits.

G. The Discharger submitted an application for renewal of its NPDES permit and waste discharge requirements (WDRs), including a report of waste discharge (ROWD), on March 29, 2011 (2011 Permit Application). The 2011 Permit application was submitted to meet the requirement in Order No. R9-2006-0065 to file a ROWD not later than 180 days in advance of the expiration date. The ROWD proposed no changes in the Facility's operational conditions or discharge flows. At that time, the permit renewal was waiting for adoption of the Desalination Amendment to the *Water Quality Control Plan for the Ocean Waters of California* (Ocean Plan) by the State Water Resources Control Board (State Water Board), as described in Section I.F of this Fact Sheet.

H. On May 6, 2015, the State Water Board 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 (Desalination Amendment). This amendment, for the first time, provides a uniform, consistent process for permitting of seawater desalination facilities statewide. The Office of Administrative Law approved the Desalination Amendment on January 28, 2016. The U.S. Environmental Protection Agency

(U.S. EPA) approved the portions of the Desalination Amendment that implement federal law on April 7, 2016 making the Desalination Amendment in full effect.

I. The Discharger filed an amended permit application including an amended ROWD, and a request for a California Water Code (Water Code or CWC) section 13142.5(b) determination for permanent stand-alone operations on September 4, 2015 (2015 ROWD). The San Diego Water Board deemed the 2015 ROWD to be complete for purposes of preparing tentative Waste Discharge Requirements/NPDES permit. However, supplemental information to inform the San Diego Water Board's Water Code section 13142.5(b) ~~d~~Determination was provided between August 18, 2016 up to ~~October~~ December 18~~22~~, 2018.

J. Regulations at 40 CFR section 122.46 limit the duration of NPDES permits to a fixed term not to exceed five years. Accordingly, Table 3 of this Order limits the duration of the discharge authorization. However, pursuant to CCR, title 23, section 2235.4, the terms and conditions of an expired permit are automatically continued pending reissuance of the Order if the Discharger complies with all federal NPDES requirements for continuation of expired permits.

K. Water Code section 13142.5(b) requires that for each new or expanded coastal powerplant or other 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. Section III.M of the Ocean Plan provides the implementation provisions for desalination facilities to comply with Water Code section 13142.5(b).

L. **Co-located and Temporary Stand-Alone Operations (2009 Determination) –** On May 13, 2009, the San Diego Water Board adopted Order No. R9-2009-0038, finding that during co-located operations with the Encina Power Station, the Discharger's implementation of the approved *Flow, Entrainment, and Impingement Minimization Plan* (see section VI.C.2.d~~c~~ of this Order) will ensure the best available site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life. Order No. R9-2009-0038 did not address the Facility operating under stand-alone conditions when the Encina Power Station permanently ceases operation. The 2009 Determination by the San Diego Water Board remains applicable until such time as the San Diego Water Board takes a final action on the ROWD.

M. **Stand-Alone Operations (2019 Determination) -** The San Diego Water Board has analyzed separately as independent considerations, and in combination, a range of intake design alternatives and brine discharge alternatives and has determined that the Facility will use the best available combination of site, design, technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life. This D~~d~~etermination is limited to stand-alone operation of the Facility, with a compliance schedule and interim measures to minimize mortality to all forms of marine life. Attachments H.1 and H.2 to this Order (collectively referred to as Attachment H) summarizes the San Diego Water Board's findings in support of its Water Code section 13142.5(b) D~~d~~etermination.

This Water Code section 13142.5(b) Determination is based upon available information. The Determination is conditional in limited part on the results of the Multiport Diffuser Analysis (required in section VI.C.2.a of this Order). The Multiport Diffuser Analysis is required to be completed within two years of the effective date of this Order confirming the San Diego Water Board's conclusion that flow augmentation is comparable to a multiport diffuser in intake and mortality of all forms of marine life at this Facility. If the Multiport Diffuser Analysis confirms the comparability of the two discharge technologies, the condition will be of no further effect. In this case, the results of the Multiport Diffuser Analysis will establish the level of intake and mortality of all forms of marine life for a multiport diffuser as the benchmark for comparison to

the results of the flow augmentation empirical study as required by Ocean Plan chapter III.M.2.d.(2)(c)v. If instead, the Multiport Diffuser Analysis fails to confirm the San Diego Water Board's conclusion of comparability under Ocean Plan chapter III.M.2.d.(2)(c), a new Water Code section 13142.5(b) determination will be required to select an appropriate brine discharge technology for the Facility.

N. Future Modified Operations - Any future expansions to the Facility as described in the Ocean Plan section III.M.1.b(2) will require a new Water Code section 13142.5(b) Dd~~d~~etermination.

II. FACILITY DESCRIPTION

A. Description

The Facility is located on a 5.7-acre parcel of land within the site of the former Encina Power Station. The Discharger has a long-term renewable lease and easement agreement with Cabrillo Power I LLC (the owner and operator of the former Encina Power Station) for the desalination plant's site.

The potable water production processes at the Facility include~~s~~ the addition of ferric sulfate and polymer, granular media filtration, reverse osmosis (RO) desalination, and product water stabilization. Ferric sulfate and polymer are added to the influent seawater to assist with the removal of fine particulates by forming floc which is then removed in the granular media filter. The ferric sulfate and polymer are removed by backwashing the granular media filter and ~~is~~ are then collected in a sedimentation basin for removal as waste sludge which is disposed of at an authorized landfill. The clarified filter backwash from the backwash pit is discharged to the Pacific Ocean via the common outfall line.

Startup maintenance flows, product water, and off-spec water may be temporarily discharged in the Pacific Ocean during initial plant start-up, during or after plant maintenance, or other times when the Facility is not delivering potable water to the regional water system. To the maximum extent practicable, these flows must be recycled to the Facility headworks for potable water production. During such temporary periods, the total maximum allowable discharge flowrate shall not exceed 330 MGD with the existing intake pumps and 299 MGD with the new intake pumps, the maximum allowable intake flowrate. Temporarily discharging such water to the Pacific Ocean does not constitute a "bypass" as defined in Attachments A and D of this Order. All limits and requirements, including monitoring, specified in this Order remain applicable during these temporary discharges.

The Facility was co-located with the Encina Power Station. The Encina Power Station ceased power generating operations on December 11, 2018. At that time, the Facility initiated interim stand-alone operations, including drawing in seawater for desalination and flow augmentation using the existing intake structure formerly operated by Encina Power Station. This Order includes a compliance schedule in Provision section VI.C.7.a, Table 7 of this Order to construct and operate a new intake structure in compliance with the Ocean Plan and the Water Code section 13142.5(b) and the requirements of this Order. Until the new intake structure is operational, the Discharger is required under Provision section VI.C.7.c of this Order to implement interim measures to minimize the mortality of all forms of marine life.

The Discharger has determined that the Facility with minor modifications would be capable of achieving a daily maximum potable water production capacity of up to 60 MGD. To reflect conditions under which this daily maximum potable water production is achieved, the Discharger has requested that the requirements of this Order pertaining to permanent stand-alone operations provide for the following:

- An average annual potable water production of up to 60 MGD;
- An average annual RO concentrate discharge of up to 60 MGD;
- Granular media filter backwash of up to 7 MGD, with the option to recycle backwash flows into the Facility's pretreatment process in lieu of discharging the backwash flow to the ocean;
- The intake and discharge of bypassed Lagoon water (flow augmentation) of up to 196 MGD.
- A total discharge for the combined backwash water, reverse osmosis concentrate, and flow augmentation water of up to 249 MGD.

Significant changes to Facility operations since Encina Power Station ceased power generating operations include:

- The Discharger proposes to install a new intake structure to withdraw up to 299 MGD of seawater directly from the Agua Hedionda Lagoon.
- The new intake will include 1-millimeter screens that are hydraulically designed to ensure that through-screen velocities are less than 0.5 foot per second, in compliance with chapter III.M.2.d.(1)(c) of the Ocean Plan.
- Diverted Lagoon water, rather than wastewater effluent from Encina Power Station, will be used to dilute the effluent from the Facility to ensure that receiving water salinity concentrations are less than 2 ppt above ambient at the edge of the Brine Mixing Zone (as defined in Attachment A) in the Pacific Ocean.

The maximum observed concentrations of various parameters in the combined Facility's historical effluent data are summarized in Tables F-2 through F-4 of this Fact Sheet. In the 2015 ROWD, the Discharger requested that this Order provide for up to 1 MGD of dewatering wastewater during the construction of the intake/discharge structures needed for transition of the Facility to stand-alone operations. This Order does not include the dewatering wastewater discharge because some of the proposed intake structures may not require groundwater dewatering during construction. In the event that dewatering is required for construction of the new intake structure, the Discharger will be required to enroll in Order No. R9-2015-0013, *General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters Within the San Diego Region,* and any reissuance*.*

Maintenance of the New Intake Structure

Maintenance requirements of the new intake structure will include periodic cleaning of the new screen system and pipeline laterals conducted in compliance with the Ocean Plan's water quality objectives and applicable requirements of this Order. In-water maintenance activities described below may trigger the need for the Discharger to apply for and obtain additional permit coverage.

The screen system will be cleaned in place by divers. If the active rotating screens (motorized) are installed, they would be equipped with a brushing mechanism that would require less biofouling cleaning by divers that would be based on a floating barge. Visual inspections would occur periodically using a submersible camera and/or diver(s) to determine cleaning requirements. An entire pipeline would be isolated to clean all screens along a pipeline at one time. The screen exterior and interior would be cleaned as follows:

1. Exterior - Divers would use a combination of manual cleaning with brushes and hydro-blasting using pressurized water spray nozzles on the external surfaces of the screens. The

seawater used for hydro-blasting would pass through one of the adjacent screens prior to use. Accumulated debris, silts, and marine sediments near the screens within the footprint of the intake structure would be removed periodically via suction pumping from a maintenance barge. The material would be discharged to a tank mounted on the barge that would filter the material from the water using siltation curtains before returning the water to the lagoon or the material would be pumped to the discharge pond and would pass through siltation curtains before exiting to the ocean. Alternatively, if permitted, material would be pumped to Fishing Beach where sediment would settle out and water would be returned to the lagoon. In this scenario, accumulated sediment would be spread out on Fishing Beach within an existing easement granted to the Discharger for this purpose or hauled off-site for disposal.

2. Interior - Both manual cleaning and hydro-blasting would be used in the internal surfaces of the screens. Divers would enter the screen via hatches (likely at one of the endcaps). Any biofouling debris that has released from within the screen would be removed using a trash pump. The trash pump would discharge to a tank mounted on the barge that would filter the biofouling debris from the water using siltation curtains before returning the water to the lagoon; or the water and debris would be pumped to the discharge pond and would pass through siltation curtains before exiting into the ocean. Solids collected would then be dewatered and hauled offsite for disposal.

Screen cleaning would occur as frequently as necessary to ensure the screening system is able to ensure reliable performance of the Facility. Under typical passive screen operating conditions, it is estimated that the screens would be cleaned once a month (12 cleanings annually) and likely less frequently if the active screens are installed. During challenging conditions such as winter storm events or algal blooms, more frequent cleaning may be required to manage debris that may collect on or near the screens.

An airburst system may be used to attempt to dislodge debris that may collect on screens. If active screens are utilized (to be determined after the demonstration project), the airburst system may not be needed.

A floating debris boom/curtain around the intake screens would block floating debris from entering the screening area. The floating debris boom extends from the surface three to 5 feet down into the water. The debris boom would be a solid barrier rather than a mesh to avoid marine life impacts. The debris boom would act as a stand-off zone to prevent the public from entering the screened area where airbursting may occur and where screens could be damaged by anchors. Portions of the floating debris boom would be adjustable to allow for surface maintenance vessel entrance/exit to the protected area. The boom would be maintained by manually removing floating debris that may accumulate.

Maintenance of the intake laterals would involve physical removal of biofouling debris by pipe pigging. Pigging would be conducted as needed to ensure the reliable performance of the Facility. The pig mechanism would be launched from the Lagoon end of the pipeline and would push the biofouling debris to the shore. Debris removed by pigging and associated flushing water would be directed to the discharge pond for settling. Debris removal operations would be designed to comply with the California Ocean Plan Water Quality Objectives.

B. Discharge Points and Receiving Waters

Co-located and Temporary Stand-alone Operations

Under the previous co-located and temporary stand-alone operations, the Facility discharged up to 54 MGD of the reverse osmosis concentrate brine and filter backwash to the Encina Power Station discharge channel. The Facility's effluent then mixed with and was diluted by the Encina Power Station's effluent in the discharge channel and discharge pond. The volume of the Encina Power Station's effluent averaged approximately 433 MGD in 2015, with the 30-day average flow ranging between 149 MGD and 645 MGD. Effluent from the Facility was monitored at Monitoring Location M-001 and the comingled effluent from the Facility and the Encina Power Station was monitored at Monitoring Location M-002 at the discharge pond.

Order No. R9-2006-0043, the current NPDES permit for the Encina Power Station, assigned an initial dilution ratio of 15.5:1 for the existing Encina Power Station discharge in the Pacific Ocean. This value was based on modeling at the Encina Power Station, considering average day conditions from 1980 through 2000.

Stand-alone Operations

The Encina Power Station ceased power generating operations on December 11, 2018. At that time, the Facility began stand-alone operations, including drawing in seawater for desalination and flow augmentation dilution water.

The Discharger submitted a discharge study to evaluate dilution as follows:

- In September 2015, the Discharger submitted Appendix C of the 2015 ROWD. To evaluate dilution at a 200-meter radius from Discharge Point No. 001. The San Diego Water Board requested the Discharger to revise the model to conform with the Ocean Plan requirements which do not take into consideration mixing in the ocean from current and wind.
- On July 12, 2016, the Discharger submitted Appendix BB of the 2015 ROWD to include an evaluation of "initial dilution" for pollutants specified in Table 1 of the Ocean Plan
- On February 21, 2017, the Discharger submitted Appendix VV of the 2015 ROWD to align with the Ocean Plan and to propose a zone of initial dilution in the receiving waters at 304.8 meters (1,000 feet) from Discharge Point No. 001.

Using a combination of CORMIX 5.0 and *COSMOS.FlowWorks* modeling, Appendix VV of the 2015 ROWD evaluated initial dilution for the Facility's effluent discharged at a maximum flowrate of 238 MGD. The model used the most conservative ambient monthly mean temperature and salinity profiles (from September 2008): the ocean water temperature was assumed to be within 2 degrees Celsius of ambient with a salinity of 42.0 ppt, which is the salinity required (at M-002) for the effluent to meet acute toxicity threshold. The model also assumed no mixing due to the action of ocean currents, waves, tides, or wind, consistent with the Ocean Plan requirements.

Based on the model, the effluent discharge plume will be negatively buoyant (denser than seawater) and will flow along the ocean bottom downslope and off-shore towards the west-northwest. When the brine plume becomes stationary, at a distance of approximately 1,851 meters from Discharge Point No. 001, the model predicts a difference in the salinity of the plume and the ambient ocean water to be less than 1 percent.

The Ocean Plan defines the zone of initial dilution as the zone in which the process of initial dilution is completed; and since dilution ceases to increase significantly beyond 1,851 meters, this distance marks the seaward limit of the zone of initial dilution. The Discharger has requested that the zone of initial dilution for this Order be set at 304.8 meters (1,000 feet), consistent with the prior Order, Order No. R9-2006-0065. At 304.8 meters (1,000 feet), the Discharger has proposed a dilution ratio of 21.83 parts sea water to 1-part undiluted brine

when also considering dilution from flow augmentation water. The dilution ratio was derived as follows:

- At 304.8 meters (1,000 feet), 1 part of diluted effluent (comprised of undiluted effluent, reverse osmosis brine, mixed with flow augmentation dilution water) is diluted by 4.75 parts ocean water, resulting in a total of 5.75 parts water.
- Flow augmentation provides a dilution of 1-part undiluted effluent (60 MGD) to 2.97 parts flow augmentation dilution water (178 MGD), resulting in a total of 3.97 parts water.
- The combined dilution from the ocean water (5.75) and the flow augmentation water (3.97) is calculated by multiplying their individual dilution factors (5.75 x 3.97) for a result of 22.83.
- The final dilution ratio is thus 1 part of undiluted effluent to 21.83 parts seawater (comprised of ocean water and flow augmentation water).

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

Effluent limitations contained in Order No. R9-2006-0065 for discharges from the Facility are summarized in the following table.

Table F-2. Historic Facility Effluent Limitations and Monitoring Data

Parameter	Units[1]	Effluent Limitations[1]			Monitoring Data (From January 2015[2] to January 2017)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Maximum Daily Discharge
Total Suspended Solids (TSS)	mg/L	60	--	--	43	--	--
pH	standard units	--	--	6.0-9.0[3]	--	--	6.82-8.17[3]
Oil and Grease	mg/L	25	40	75[3]	5.9	8.4	8.6[3]
Settleable Solids	ml/L	1.0	1.5	3.0[3]	0.2	0.25	0.4[3]
Turbidity	NTU	75	100	225[3]	4.23	12	19[3]
Chronic Toxicity	TUc	--	--	16.5	--	--	>40

1 See Attachment A for definitions of abbreviations and a glossary of common terms used in this Order.
2 The Facility began discharging wastewater in January of 2015.
3 Instantaneous minimum and instantaneous maximum values.

Table F-3. Historic Combined Facility and Encina Power Station Effluent Limitations at M-002

Parameter	Units[1]	Effluent Limitations		Monitoring Data (January 2015 to January 2017)
		Average Daily	Average Hourly	Highest Detected Discharge
Total Dissolved Solids (as Salinity)	ppt	40	44	40

[1] Encina Power Station operations do not appreciably increase the salinity of the intake water, and any violation of the combined Encina Power Station and Facility salinity limits shown above are attributed to the Facility.

Table F-4. Historic Performance Goals

Parameter	Unit[1]	Historic Performance Goals[1,2]				Monitoring Data (January 2015 to January 2017)
		6-Month Median	Maximum Daily	Instantaneous Maximum	30-Day Average	Highest Detected Discharge
BASED ON OCEAN PLAN OBJECTIVES FOR PROTECTION OF MARINE AQUATIC LIFE						
Arsenic, Total Recoverable	µg/l	8.55E+01	4.81E+02	1.27E+03	--	3.3
Cadmium, Total Recoverable	µg/l	1.65E+01	6.60E+01	1.65E+02	--	0.044
Chromium VI[3]	µg/l	3.30E+01	1.32E+02	3.30E+02	--	<0.0048
Copper, Total Recoverable	µg/l	1.85E+01	1.67E+02	4.64E+02	--	2.7
Lead, Total Recoverable	µg/l	3.30E+01	1.32E+02	3.30E+02	--	0.91
Mercury, Total Recoverable[4]	µg/l	6.52E-01	2.63E+00	6.59E+00	--	0.52
Nickel, Total Recoverable	µg/l	8.25E+01	3.30E+02	8.25E+02	--	8.9
Selenium, Total Recoverable	µg/l	2.47E+02	9.90E+02	2.47E+03	--	2.3
Silver, Total Recoverable	µg/l	9.07E+00	4.37E+01	1.13E+02	--	0.033
Zinc, Total Recoverable	µg/l	2.06E+02	1.20E+03	3.18E+03	--	78
Cyanide, Total[5]	µg/l	1.65E+01	6.60E+01	1.65E+02	--	<0.01
Total Chlorine Residual	µg/l	3.30E+01	1.32E+02	9.90E+02	--	NA
Ammonia (expressed as nitrogen)	µg/l	9.90E+03	3.96E+04	9.90E+04	--	520
Phenolic Compounds (non-chlorinated)	µg/l	4.95E+02	1.98E+03	4.95E+03	--	<0.57
Chlorinated Phenolics	µg/l	1.65E+01	6.60E+01	1.65E+02	--	<0.77
Endosulfan	µg/l	1.48E-01	2.97E-01	4.46E-01	--	<0.003
Endrin	µg/l	3.30E-02	6.60E-02	9.90E-02	--	<0.001
HCH	µg/l	6.60E-02	1.32E-01	1.98E-01	--	<0.004
Radioactivity	pCi/l	Not to exceed limits specified in title 17, division 1, chapter 5, subchapter 4, group 3, article 3, section 30253 of the CCR, Reference to section 30253 is prospective, including future changes to any incorporated provisions of federal law, as the changes take effect.				343

Parameter	Unit[1]	Historic Performance Goals[1,2]				Monitoring Data (January 2015 to January 2017)
		6-Month Median	Maximum Daily	Instantaneous Maximum	30-Day Average	Highest Detected Discharge
BASED ON OCEAN PLAN OBJECTIVES FOR PROTECTION OF HUMAN HEALTH – NONCARCINOGENS						
Acrolein	µg/l	--	--	--	3.63E+03	<0.44
Antimony	µg/l	--	--	--	1.98E+04	0.88
Bis(2-chloroethoxy) Methane	µg/l	--	--	--	7.26E+01	<0.16
Bis(2-chloroisopropyl) ether	µg/l	--	--	--	1.98E+04	<0.16
Chlorobenzene	µg/l	--	--	--	9.41E+03	<0.21
Chromium (III)	µg/l	--	--	--	3.14E+06	5.3
Di-n-butyl Phthalate	µg/l	--	--	--	5.78E+04	<0.12
Dichlorobenzenes	µg/l	--	--	--	8.42E+04	<0.37
Diethyl Phthalate	µg/l	--	--	--	5.45E+05	<0.14
Dimethyl Phthalate	µg/l	--	--	--	1.35E+07	<0.15
4,6-dinitro-2-methylphenol	µg/l	--	--	--	3.63E+03	<0.12
2,4-dinitrophenol	µg/l	--	--	--	6.60E+02	<0.14
Ethylbenzene	µg/l	--	--	--	6.77E+04	<0.17
Fluoranthene	µg/l	--	--	--	2.48E+02	<0.13
Hexachloro-cyclopentadiene	µg/l	--	--	--	9.57E+02	<0.1
Nitrobenzene	µg/l	--	--	--	8.09E+01	<0.36
Thallium	µg/l	--	--	--	3.30E+01	1.2
Toluene	µg/l	--	--	--	1.40E+06	<0.22
Tributyltin	µg/l	--	--	--	2.31E-02	0.0019
1,1,1-trichloroethane	µg/l	--	--	--	8.91E+06	<0.38
BASED ON OCEAN PLAN OBJECTIVES FOR PROTECTION OF HUMAN HEALTH - CARCINOGENS						
Acrylonitrile	µg/l	--	--	--	1.65E+00	<0.27
Aldrin	µg/l	--	--	--	3.63E-04	<0.001
Benzene	µg/l	--	--	--	9.74E+01	<0.23
Benzidine	µg/l	--	--	--	1.14E-03	<0.53
Beryllium	µg/l	--	--	--	5.45E-01	<0.039
Bis(2-chloroethyl) Ether	µg/l	--	--	--	7.43E-01	<0.14
Bis(2-ethlyhexyl) Phthalate	µg/l	--	--	--	5.78E+01	36
Carbon Tetrachloride	µg/l	--	--	--	1.49E+01	<0.32
Chlorodane	µg/l	--	--	--	3.80E-04	<0.01
Chlorodibromomethane	µg/l	--	--	--	1.42E+02	<0.29
Chloroform	µg/l	--	--	--	2.15E+03	<0.25
DDT	µg/l	--	--	--	2.81E-03	<0.0038
1,4-dichlorobenzene	µg/l	--	--	--	2.97E+02	<0.15
3,3'-dichlorobenzidine	µg/l	--	--	--	1.34E-01	<0.9

Parameter	Unit[1]	Historic Performance Goals[1,2]				Monitoring Data (January 2015 to January 2017)
		6-Month Median	Maximum Daily	Instantaneous Maximum	30-Day Average	Highest Detected Discharge
1,2-dichloroethane	µg/l	--	--	--	4.62E+02	<0.24
1,1-dichloroethylene	µg/l	--	--	--	1.49E+01	<0.34
Dichlorobromomethane	µg/l	--	--	--	1.02E+02	<0.28
Dichloromethane	µg/l	--	--	--	7.43E+03	<0.25
1,3-dichloropropene	µg/l	--	--	--	1.47E+02	<0.22
Dieldrin	µg/l	--	--	--	6.60E-04	<0.001
2,4-dinitrotoluene	µg/l	--	--	--	4.29E+01	<0.16
1,2-diphenylhydrazine	µg/l	--	--	--	2.64E+00	<0.25
Halomethanes	µg/l	--	--	--	2.15E+03	<1.05
Heptachlor	µg/l	--	--	--	8.25E-04	<0.0017
Heptachlor Epoxide	µg/l	--	--	--	3.30E-04	<0.001
Hexachlorobenzene	µg/l	--	--	--	3.47E-03	<0.008
Hexachlorobutadiene	µg/l	--	--	--	2.31E+02	<0.14
Hexachloroethane	µg/l	--	--	--	4.13E+01	<0.15
Isophorone	µg/l	--	--	--	1.20E+04	<0.2
N-nitrosodimethylamine	µg/l	--	--	--	1.20E+02	<0.14
N-nitrosodi-N-propylamine	µg/l	--	--	--	6.27E+00	<0.21
N-nitrosodiphenylamine	µg/l	--	--	--	4.13E+01	<0.19
PAHs	µg/l	--	--	--	1.45E-01	<2
PCBs	µg/l	--	--	--	3.14E-04	<0.42
TCDD equivalents	µg/l	--	--	--	6.44E-08	4.34E-06
1,1,2,2-tetrachloroethane	µg/l	--	--	--	3.80E+01	<0.18
Tetrachloroethylene	µg/l	--	--	--	3.30E+01	<0.27
Toxaphene	µg/l	--	--	--	3.47E-03	<0.12
Trichloroethylene	µg/l	--	--	--	4.46E+02	<0.35
1,1,2-trichloroethane	µg/l	--	--	--	1.55E+02	<0.34
2,4,6-trichlorophenol	µg/l	--	--	--	4.79E+00	<0.13
Vinyl Chloride	µg/l	--	--	--	5.94E+02	<0.33

1 See Attachment A for definitions of abbreviations and a glossary of common terms used in this Order.

2 Scientific "E" notation is used to express certain values. In scientific "E" notation, the number following the "E" indicates that position of the decimal point in the value. Negative numbers after the "E" indicate that the value is less than 1, and positive numbers after the "E" indicate that the value is greater than 1. In this notation a value of 6.1E-02 represents 6.1×10^{-2} or 0.061, 6.1E+02 represents 6.1×10^{2} or 610, and 6.1E+00 represents 6.1×10^{0} or 6.1.

3 Discharger may, at its option, meet this limitation (or apply this performance goal) as a total chromium limitation (or performance goal).

4 U.S. EPA Method 1631E, with a quantitation level of 0.5 ng/L, shall be used to analyze total mercury.

5 If a Discharger can demonstrate to the satisfaction of the San Diego Water Board (subject to U.S. EPA approval) that an analytical method is available to reliably distinguish between strongly and weakly complexed cyanide, effluent limitations for cyanide may be met by (or performance goals may be evaluated with) the combined measurement of free cyanide, simple alkali metals cyanides, and weakly complexed organometallic cyanide complexes. In order for the analytical method to be acceptable, the recovery of free cyanide from metal complexes must be comparable to that achieved by the approved method in title 40 CFR part 136, as revised May 14, 1999.

1. Salinity and Toxicity Studies

The Discharger was required to conduct two salinity-related acute toxicity studies to evaluate compliance with the acute toxicity performance goal, to confirm the results of prior studies on which effluent salinity limitations had been based, and to identify the maximum amount of salinity that can be discharged without causing acute toxicity.

The Discharger submitted an Acute Toxicity Study as Appendix G to the 2015 ROWD. The study focused on two species, the Pacific topsmelt *(Atherinops affinis)* and the mysid shrimp *(Americamysis bahia)*, during two rounds of testing performed in February and March of 2015. The test found no observed toxicity in Pacific topsmelt at 44 ppt in either test. Toxicity was observed using the Test of Significant Toxicity for mysid shrimp at 44 ppt in the test initiated in February 2015, and resulted in a no observable effect concentration (NOEC) of 42.0 ppt. No statistical effects were observed in the March 2015 test for mysid shrimp, and a NOEC at 44 ppt was identified.

The Discharger submitted a Chronic Toxicity Study as Appendix H to the 2015 ROWD. The test evaluated salinity tolerance of multiple species. In tests summarized in the study, no statistical effects were observed in any concentration of Pacific topsmelt *(Atherinops affinis)*, giant kelp *(Macrocystis pyrifera)*, purple urchin *(Strongylocentrotus purpuratus)* or sand dollar *(Dendraster excentricus)* fertilization, or the sand dollar larval development tests, resulting in a Lowest Observed Effect Concentration of >38.5 ppt. The larval endpoints for purple urchins and abalone *(Haliotis rufescens)* were the most sensitive to increased salinity during the testing with NOECs identified at 36.5 ppt and 36.0 ppt, respectively.

D. Compliance Summary

The following summarizes the compliance history for the period of September 2015 through January 2018~~7~~:

Table F-5. Summary of Compliance History

Date	Violation type	Description
9/17/2015	Unauthorized Discharge	On September 17, 2015, the rinse pit overflowed during start-up operations and discharged to the storm drain system into Agua Hedionda Lagoon.
10/28/2015	Deficient Monitoring	The 3rd Quarter 2015 monitoring report used Minimum Levels (MLs) that were not approved by the Executive Officer and that did not meet the standards in Appendix II of the 2005 Ocean Plan.
11/13/2015	Receiving Water Limitation Exceedance	On November 13, 2015, the effluent discharge from the Facility caused a discoloration of the Pacific Ocean in the vicinity of the outfall.
1/27/2016	~~Effluent Limitation Exceedance~~Deficient Monitoring	4th Quarter 2015 monitoring reports used MLs that were not approved by the Executive Officer and that did not meet the standards in Appendix II of the 2005 Ocean Plan.
3/24/2016	Unauthorized Discharge	On March 24, 2016, the rinse pit overflowed during start-up operations and discharged to the storm drain system into Agua Hedionda lagoon.

On April 7, 2016, the San Diego Water Board issued Notice of Violation No. R9-2016-0112 for the aforementioned violations of Order No. R9-2006-0065 through March 24, 2016.

The Discharger has revised their operating protocol and system control computer program to prevent rinse pit overflows. The Discharger changed their contract laboratory to a laboratory

that can achieve the required MLs. The cause of the November 13, 2015 receiving water limitation exceedance was due to an unanticipated washout of solids accumulation in a pipeline. The Discharger constructed a new pipeline within the Facility to prevent an accumulation of solids in the pipelines.

Additionally, between December 2015 through January 2018, the Discharger reported 61 exceedances of the chronic toxicity maximum daily effluent limitation of 16.5 TUc at monitoring location M-001 of the undiluted brine. In response to the effluent limitation exceedances for chronic toxicity, the Discharger reported that the violations are an artifact of the chronic toxicity effluent limitation in Order No. R9-2006-0065 not accounting for the flow augmentation dilution water provided by the Encina Power Station. Monitoring samples that account for the flow augmentation dilution water provided by the Encina Power Station did meet the chronic toxicity effluent limitation prior to discharging to the Pacific Ocean, and also passed the TST statistical approach for determining compliance with chronic toxicity monitoring included in this Order. Nevertheless, the Discharger conducted an extensive Toxicity Identification Evaluation (TIE), and the results were inconclusive as to the source and cause of toxicity.

E. Planned Changes

See section II.A of this Fact Sheet for a description of planned changes to the Facility.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order serves as WDRs pursuant to article 4, chapter 4, division 7 of the Water Code (commencing with section 13260). This Order is also issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (U.S. EPA) and chapter 5.5, division 7 of the Water Code (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this Facility to surface waters of the U.S. at the discharge location described in Table 2 of the Order, subject to the WDRs in this Order. This Order also includes the San Diego Water Board's Water Code section 13142.5(b) ~~d~~Determination.

B. California Environmental Quality Act (CEQA)

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of chapter 3 of the CEQA, (commencing with section 21100, et. seq.) of division 13 of the Public Resources Code. However, compliance with CEQA is required for those provisions in this Order that are based on State law only. This Order's ~~d~~Determination that the Facility complies with Water Code section 13142.5(b) is ~~a determination~~ based on consideration of State law only and is subject to CEQA compliance. In August 2016, the SDCWA certified the *Final Supplement to the Precise Development Plan and Desalination Plant Project Final Environmental Impact Report (EIR 03-05, State Clearinghouse No. 2004041081)* (Final SEIR). ~~In January 2019, the SDCWA approved the Sixth Addendum to the Final EIR.~~ Following certification of the Final SEIR, the SDCWA finalized the *Sixth Addendum to the Final EIR* in February 2019. The San Diego Water Board independently considered the environmental effects of the project as described in the 2006 EIR, the 2016 Supplemental EIR, and addendums.

C. State and Federal Laws, Regulations, Policies, and Plans

1. **Water Quality Control Plan.** The San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Resources Control Board (State Water Board). Beneficial uses applicable to the Pacific Ocean specified in the Basin Plan are as follows:

Table F-6. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Pacific Ocean	Industrial service supply; navigation; contact water recreation; non-contact water recreation; commercial and sport fishing; preservation of biological habitats of special significance; wildlife habitat; rare, threatened, or endangered species; marine habitat; aquaculture; migration of aquatic organisms; spawning, reproduction, and/or early development; and shellfish harvesting.

To protect the beneficial uses, the Basin Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Basin Plan.

2. **California Ocean Plan.** The State Water Board adopted the *Water Quality Control Plan for Ocean Waters of California, California Ocean Plan* (Ocean Plan) in 1972 and has made subsequent amendments, most recently on August 7, 2018. The State Water Board adopted Chapter III.M, regarding desalination facilities, on May 6, 2015, and it became effective on January 28, 2016. Chapter III.M of the Ocean Plan provides the implementation provisions for desalination facilities to comply with Water Code section 13142.5(b). The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. The Ocean Plan identifies beneficial uses of ocean waters of the State to be protected as summarized below:

Table F-7. Ocean Plan Beneficial Uses

Discharge Point	Receiving Water	Beneficial Uses
001	Pacific Ocean	Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance (ASBS); rare and endangered species; marine habitat; fish spawning and shellfish harvesting

To protect the beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan.

3. **Thermal Plan.** The State Water Board adopted the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972 and amended this plan on September 18, 1975. This plan contains temperature objectives for surface waters. Requirements of this Order implement the Thermal Plan.

4. **Antidegradation Policy.** Federal regulations at 40 CFR section 131.12 require that the State water quality standards include an antidegradation policy consistent with the

federal antidegradation policy. The State Water Board established California's antidegradation policy in Resolution No. 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*). Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The permitted discharge must be consistent with the antidegradation provisions of 40 CFR section 131.12 and Resolution No. 68-16.

5. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.

6. **Endangered Species Act Requirements.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S. Code Annotated sections 1531 to 1544). This Order requires compliance with effluent limitations, receiving water limitations, and other requirements to protect the beneficial uses of waters of the State. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

D. Impaired Water Bodies on the CWA Section 303(d) List

In July 2015, U.S. EPA approved the list of impaired water bodies, prepared by the State Water Board pursuant to section 303(d) of the CWA, which are not expected to meet applicable water quality standards after implementation of technology-based effluent limitations (TBELs) for point sources.

Currently, no impaired waterbodies are on the current CWA section 303(d) List, approved by the San Diego Water Board on October 12, 2016, and no total maximum daily loads (TMDL) are effective for the Pacific Ocean near the Facility.

E. Other Plans, Policies, and Regulations - Water Code Section 13142.5(b) Determination

Water Code section 13142.5(b) requires that for each new or expanded coastal power plant or other industrial installation using seawater for cooling, heating, or industrial processing, best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life. Chapter III.M of the Ocean Plan provides the implementation provisions for desalination facilities to comply with Water Code section 13142.5(b).

<u>Co-located and Temporary Stand-alone Operations (2009 Water Code section 13142.5(b) Determination)</u>

On May 13, 2009, the San Diego Water Board adopted Order No. R9-2009-0038, finding that during co-located operations with the Encina Power Station, the Discharger's implementation of the approved *Flow, Entrainment, and Impingement Minimization Plan* would ensure the best available site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life. Order No. R9-2009-0038 did not address the Facility operating under stand-alone conditions when the Encina Power Station permanently ceases operation.

<u>Stand-alone Operations (2019 Water Code section 13142.5(b) Determination)</u>

The San Diego Water Board has analyzed separately as independent considerations, and in combination, a range of intake design alternatives proposed by the Discharger and has determined that the Facility will use the best available site, design, technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life. Attachment H to this Order summarize the considerations and basis for this Water Code section 13142.5(b) ~~d~~Determination. Section VI.C.10.a of the Order includes a compliance schedule in Table 7, pursuant to chapter III.M.2.a(5)(b) of the Ocean Plan. This compliance schedule provides the Discharger the minimum time necessary to design, construct, and operate a new intake structure in compliance with the Ocean Plan, Water Code section 13142.5(b), and the requirements of this Order. The compliance schedule is expected to allow the Discharger to complete the Multiport Diffuser Analysis in the early design phases of the new intake structure. Until a new intake structure is constructed, the Discharger is required to implement interim measures under Provision section VI.C.7.c of this Order to minimize the intake and mortality of all forms of marine life.

The Ocean Plan at chapter III.M.2.a.(5) authorizes a regional water board to expressly condition a Water Code section 13142.5(b) determination on the expectation of the occurrence of a future event. This Order at section VI.C.2.a requires the Discharger to complete the Multiport Diffuser Analysis. The Multiport Diffuser Analysis is required to be completed within two years of the Order's effective date and will provide additional scientific data to establish a benchmark regarding the intake and mortality of all forms of marine life associated with a multiport diffuser. If the Multiport Diffuser Analysis confirms the San Diego Water Board's conclusion that flow augmentation and a multiport diffuser provide a comparable level of intake and mortality of all forms of marine life for purposes of Ocean Plan chapter III.M.2.d.(2)(c), the condition will have no further effect. With the condition removed, the results of the Multiport Diffuser Analysis will establish the level of intake and mortality of all forms of marine life for a multiport diffuser as a benchmark for purposes of the comparison to the flow augmentation empirical study as required in Ocean Plan chapter III.M.2.d.(2)(c)v. If instead, the Multiport Diffuser Analysis fails to confirm the conclusion that the two technologies are comparable in intake and mortality of all forms of marine life as required in chapter III.M.2.d.(2)(c) of the Ocean Plan, a new Water Code section 13142.5(b) determination to select an appropriate brine discharge technology will be required.

Future Modified Operations

Any proposed changes in the design or operation of the Facility that could increase the intake or mortality of all forms of marine life beyond that which is approved by this Order would meet the definition of an expanded facility within the meaning of the Ocean Plan. See, Chapter III.M.1(b)(2). Any such expansion will require a new Water Code section 13142.5(b) determination in accordance with the Ocean Plan.

IV. RATIONALE FOR EFFLUENT LIMITATIONS, INTAKE SPECIFICATIONS, AND DISCHARGE SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the U.S. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in the Code of Federal Regulations (CFR): 40 CFR section 122.44(a) requires that permits include applicable technology-based limitations and standards (TBELs); and 40 CFR section 122.44(d) requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water.

A. Discharge Prohibitions

This Order retains discharge prohibitions from Order No. R9-2006-0065:

1. Prohibitions III.A and III.D have been carried over from the requirements in Order No. R9-2006-0065. These prohibitions are based on 40 CFR section 122.21(a), duty to apply, and Water Code section 13260, which requires filing a ROWD before discharges can occur. Discharges not described in the 2015 ROWD, and subsequently also not regulated in this Order, are prohibited.

2. Prohibitions III.B and III.C are based on the requirements of the Ocean Plan and the Basin Plan, respectively.

B. Technology-Based Effluent Limitations (TBELs)

1. Scope and Authority

CWA section 301(b) and implementing U.S. EPA permit regulations at 40 CFR section 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Best Professional Judgment (BPJ) in accordance with 40 CFR section 125.3. Discharges from the Facility must also meet TBELs based on Table 2 of the Ocean Plan.

The CWA requires that TBELs be established based on several levels of controls:

i. Best practicable treatment control technology (BPT) represents the average of the best existing performance by well-operated facilities within an industrial category or subcategory. BPT standards apply to toxic, conventional, and non-conventional pollutants.

ii. Best available technology economically achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an industrial point source category. BAT standards apply to toxic and non-conventional pollutants.

iii. Best conventional pollutant control technology (BCT) represents the control from existing industrial point sources of conventional pollutants including Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), fecal coliform, pH (Hydrogen ion concentration), and oil and grease. The BCT standard is established after considering a two-part reasonableness test. The first test compares the relationship between the costs of attaining a reduction in effluent discharge and the resulting benefits. The second test examines the cost and level of reduction of pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources. Effluent limitations must be reasonable under both tests.

iv. New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources.

The CWA requires U.S. EPA to develop effluent limitations, guidelines and standards (ELGs) representing application of BPT, BAT, BCT, and NSPS. Section 402(a)(1) of the CWA and 40 CFR section 125.3 authorize the use of BPJ to derive TBELs on a case-by-case basis where ELGs are not available for certain industrial categories and/or pollutants of concern. Where BPJ is used, the San Diego Water Board must consider specific factors outlined in 40 CFR section 125.3.

2. Applicable TBELs

a. Ocean Plan. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Therefore, the discharge of wastewater to the Pacific Ocean from the Facility is subject to the Ocean Plan.

The Ocean Plan establishes water quality objectives, general requirements for management of waste discharged to the ocean, effluent quality requirements for waste discharges, discharge prohibitions, and general provisions. Further, Table 2 of the Ocean Plan establishes TBELs for discharges of pollutants for which ELGs have not been established pursuant to sections 301, 302, 304, or 306 of the CWA. Based on Table 2 of the Ocean Plan, San Diego Water Board Order No. R9-2006-0065 established numeric effluent limitations for the discharge of effluent to the Pacific Ocean. Consistent with the requirements of the Ocean Plan, these effluent limitations have been carried over.

The TBELs from the Ocean Plan are summarized below:

Table F-8. Summary of TBELs

Parameter	Units	Effluent Limitations			
		Average Monthly	Average Weekly	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	60	--	--	--
pH	standard units	--	--	6.0	9.0
Oil and Grease	mg/L	25	40	--	75
Settleable Solids	ml/L	1.0	1.5	--	3.0
Turbidity	NTU	75	100	--	225

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

CWA Section 301(b) and 40 CFR section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

Section 122.44(d)(1)(i) of 40 CFR requires that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) U.S. EPA criteria guidance under section 304(a) of the CWA, supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in 40 CFR section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan and Ocean Plan, and to achieve applicable water quality objectives and criteria that are contained in the Ocean Plan.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

The Basin Plan and Ocean Plan designate beneficial uses, establish water quality objectives, and contain implementation programs and policies to achieve those objectives for all waters.

a. Basin Plan. The beneficial uses specified in the Basin Plan applicable to the Pacific Ocean are summarized in section III.C.1 of this Fact Sheet.

The Basin Plan includes water quality objectives for pH applicable to ocean waters is stated as follows: "*The pH value shall not be changed at any time more than 0.2pH units from that which occurs naturally."*

The Basin Plan states: *"The terms and conditions of the State Board's "Water Quality Control Plan for Ocean Waters of California" (Ocean Plan), "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" (Thermal Plan), and any revisions thereto are incorporated into this Basin Plan by reference. The terms and conditions of the Ocean Plan and Thermal Plan apply to the ocean waters within this Region."*

b. Ocean Plan. The beneficial uses specified in the Ocean Plan for the Pacific Ocean are summarized in section III.C.2 of this Fact Sheet. The Ocean Plan also includes water quality objectives for the ocean receiving water for bacterial characteristics, physical characteristics, chemical characteristics, biological characteristics, and radioactivity.

Table 1 of the Ocean Plan includes the following water quality objectives for toxic pollutants and whole effluent toxicity:

i. 6-month median, daily maximum, and instantaneous maximum objectives for 21 chemicals and chemical characteristics, including total chlorine residual and chronic toxicity, for the protection of marine aquatic life.

ii. 30-day average objectives for 20 non-carcinogenic chemicals for the protection of human health.

iii. 30-day average objectives for 42 carcinogenic chemicals for the protection of human health.

iv. Daily maximum objectives for acute and chronic toxicity.

Additionally, the Ocean Plan establishes receiving water objectives for salinity applicable to desalination facilities.

3. Determining the Need for WQBELs

Order No. R9-2006-0065 contained effluent limitations for non-conventional and toxic pollutant parameters based on the water quality objectives in Table 1 of the Ocean Plan. For this Order, the need for effluent limitations based on water quality objectives in Table 1 of the Ocean Plan was re-evaluated in accordance with 40 CFR section 122.44(d) and guidance for statistically determining the "reasonable potential" for a discharged pollutant to exceed an objective, as outlined in the revised *Technical Support Document for Water Quality-based Toxics Control* (TSD; EPA/505/2-90-001, 1991) and the Ocean Plan Reasonable Potential Analysis (RPA) Amendment that was adopted by the State Water Board on April 21, 2005. The statistical approach combines knowledge of effluent variability (as estimated by a coefficient of variation) with the uncertainty due to a limited amount of effluent data to estimate a maximum effluent value at a high level of

confidence. This estimated maximum effluent value is based on a lognormal distribution of daily effluent values. Projected receiving water values (based on the estimated maximum effluent value or the reported maximum effluent value and minimum probably initial dilution) can then be compared to the appropriate objective to determine potential for an exceedance of that objective and the need for an effluent limitation. According to the Ocean Plan amendment, the RPA can yield one of three endpoints:

1) An effluent limitation is required, and monitoring is required;

2) An effluent limitation is not required, and the San Diego Water Board may require monitoring; or

3) The RPA is inconclusive, monitoring is required, and an existing effluent limitation may be retained, or a permit reopener clause may be included to allow inclusion of an effluent limitation if future monitoring warrants the inclusion. Endpoint 3 is typically the result when there are fewer than 16 data points and all are censored data (i.e., below quantitation or method detection levels for an analytical procedure).

The implementation provisions for Table 1 in section III.C of the Ocean Plan specify that the minimum initial dilution is the lowest average initial dilution within any single month of the year. Dilution estimates are to be based on observed waste flow characteristics, observed receiving water density structure, and the assumption that no currents, of sufficient strength to influence the initial dilution process, flow across the discharge structure. Before establishing a dilution credit for a discharge, it must first be determined if, and how much, receiving water is available to dilute the discharge.

Conventional pollutants were not considered as part of the RPA. TBELs for these pollutants are included in this Order as described in section IV.B of this Fact Sheet.

Using the RPcalc 2.0 software tool developed by the State Water Board for conducting RPAs, the San Diego Water Board has conducted the RPA for the constituents listed in Table F-9. For constituents that do not display reasonable potential, this Order includes desirable maximum effluent concentrations (MEC) which were derived using effluent limitation determination procedures described below and are referred to in this Order as “performance goals”. A narrative limit statement to comply with all Ocean Plan objectives requirements is provided for those parameters not displaying reasonable potential. The Discharger is required to monitor for these parameters as stated in the Monitoring and Reporting Program (MRP) (Attachment E) to gather data for use in reasonable potential analyses for future permit reissuances.

Effluent data provided in the Discharger’s monitoring reports for the Facility from March 2015 through January 2017 were used in the RPA. A minimum probable initial dilution of 21.83 to 1 was considered in this evaluation. A summary of the RPA results is provided below:

Table F-9. RPA Results Summary

Parameter	Units	n[1]	MEC[2,3]	Most Stringent Criteria	Background	RPA Endpoint[4]
Arsenic	µg/L	8	3.3	8[5]	3[6]	2
Cadmium	µg/L	8	0.044	1[5]	0	2
Chromium, Total Recoverable	µg/L	8	<0.0048	2[5]	0	3
Copper	µg/L	8	2.7	3[5]	2[6]	2
Lead	µg/L	8	0.91	2[5]	0	2
Mercury	µg/L	8	0.52	0.04[5]	0.0005[6]	3
Nickel	µg/L	8	8.9	5[5]	0	2

Parameter	Units	n[1]	MEC[2,3]	Most Stringent Criteria	Background	RPA Endpoint[4]
Selenium	µg/L	8	2.3	15[5]	0	2
Silver	µg/L	8	0.033	0.7[5]	0.16[6]	3
Zinc	µg/L	8	78	20[5]	8[6]	2
Cyanide	µg/L	8	<0.01	1[5]	0	3
Total Residual Chlorine[10]	µg/L	NA	NA	2[5]	0	NA
Ammonia	µg/L	8	520	600[5]	0	2
Acute Toxicity[7,11]	TUa	7	0.82	0.3	0	2
Chronic Toxicity	TUc	258	>40	1[7]	0	1
Phenolic Compounds	µg/L	8	<0.57	30[5]	0	3
Chlorinated Phenolics	µg/L	8	<0.57	1[5]	0	3
Endosulfan	µg/L	8	<0.003	0.009[5]	0	3
Endrin	µg/L	8	<0.001	0.002[5]	0	3
HCH[12]	µg/L	8	<0.004	0.004[5]	0	3
Radioactivity	pci/L	8	343	[8]	0	--
Acrolein	µg/L	8	<0.44	220[9]	0	3
Antimony	µg/L	8	0.88	1,200[9]	0	2
Bis(2-chloroethoxyl)methane	µg/L	8	<0.16	4.4[9]	0	3
Bis(2-chloroisopropyl)ether	µg/L	8	<0.16	1,200[9]	0	3
Chlorobenzene	µg/L	8	<0.21	570[9]	0	3
Chromium (III)	µg/L	8	5.3	190,000[9]	0	2
Di-n-butyl phthalate	µg/L	8	<0.12	3,500[9]	0	3
Dichlorobenzenes	µg/L	8	<0.37	5,100[9]	0	3
Diethyl phthalate	µg/L	8	<0.14	33,000[9]	0	3
Dimethyl phthalate	µg/L	8	<0.15	820,000[9]	0	3
4,6-Dinitro-2-methylphenol	µg/L	8	<0.12	220[9]	0	3
2,4-Dinitrophenol	µg/L	8	<0.14	4.0[9]	0	3
Ethylbenzene	µg/L	8	<0.17	4,100[9]	0	3
Fluoranthene	µg/L	8	<0.13	15[9]	0	3
Hexachlorocyclopentadiene	µg/L	8	<0.1	58[9]	0	3
Nitrobenzene	µg/L	8	<0.36	4.9[9]	0	3
Thallium	µg/L	8	1.2	2[9]	0	2
Toluene	µg/L	8	<0.22	85,000[9]	0	3
Tributyltin	µg/L	8	0.0019	0.0014[9]	0	3
1,1,1-Trichloroethane	µg/L	8	<0.38	540,000[9]	0	3
Acrylonitrile	µg/L	8	<0.27	0.10[9]	0	3
Aldrin	µg/L	8	<0.001	0.000022[9]	0	3
Benzene	µg/L	8	<0.23	5.9[9]	0	3
Benzidine	µg/L	8	<0.53	0.000069[9]	0	3
Beryllium	µg/L	8	<0.039	0.033[9]	0	3
Bis(2-chloroethyl) ether	µg/L	8	<0.14	0.045[9]	0	3
Bis(2-ethylhexyl) phthalate[13]	µg/L	14	36	3.5[9]	0	2
Carbon tetrachloride	µg/L	8	<0.32	0.90[9]	0	3
Chlordane	µg/L	8	<0.01	0.000023[9]	0	3
Chlorodibromomethane	µg/L	8	<0.29	8.6[9]	0	3
Chloroform	µg/L	8	<0.25	130[9]	0	3
DDT[12]	µg/L	8	<0.0038	0.00017[9]	0	3
1,4-Dichlorobenzene	µg/L	8	<0.15	18[9]	0	3
3,3-Dichlorobenzidine	µg/L	8	<0.9	0.0081[9]	0	3
1,2-Dichloroethane	µg/L	8	<0.24	28[9]	0	3
1,1-Dichloroethylene	µg/L	8	<0.34	0.9[9]	0	3
Dichlorobromomethane	µg/L	8	<0.28	6.2[9]	0	3
Dichloromethane	µg/L	8	<0.25	450[9]	0	3

Parameter	Units	n[1]	MEC[2,3]	Most Stringent Criteria	Background	RPA Endpoint[4]
1,3-Dichloropropene	µg/L	8	<0.22	8.9[9]	0	3
Dieldrin	µg/L	8	<0.001	0.00004[9]	0	3
2,4-Dinitrotoluene	µg/L	8	<0.16	2.6[9]	0	3
1,2-Diphenylhydrazine	µg/L	8	<0.25	0.16[9]	0	3
Halomethanes	µg/L	8	<1.05	130[9]	0	3
Heptachlor	µg/L	8	<0.0017	0.00005[9]	0	3
Heptachlor Epoxide	µg/L	8	<0.001	0.00002[9]	0	3
Hexachlorobenzene	µg/L	8	<0.008	0.00021[9]	0	3
Hexachlorobutadiene	µg/L	8	<0.14	14[9]	0	3
Hexachloroethane	µg/L	8	<0.15	2.5[9]	0	3
Isophorone	µg/L	8	<0.2	730[9]	0	3
N-nitrosodimethylamine	µg/L	8	<0.14	7.3[9]	0	3
N-nitrosodi-N-propylamine	µg/L	8	<0.21	0.38[9]	0	3
N-nitrosodiphenylamine	µg/L	8	<0.19	2.5[9]	0	3
PAHs	µg/L	8	<2	0.0088[9]	0	3
PCBs	µg/L	8	<0.42	0.000019[9]	0	3
TCDD equivalents[11]	µg/L	8	0.0000043	0.0000000039[9]	0	1
1,1,2,2-Tetrachoroethane	µg/L	8	<0.18	2.3[9]	0	3
Tetrachloroethylene	µg/L	8	<0.27	2.0[9]	0	3
Toxaphene	µg/L	8	<0.12	0.00021[9]	0	3
Trichloroethylene	µg/L	8	<0.35	27[9]	0	3
1,1,2-Trichloroethane	µg/L	8	<0.25	9.4[9]	0	3
2,4,6-Trichlorophenol	µg/L	8	<0.13	0.29[9]	0	3
Vinyl Chloride	µg/L	8	<0.33	36[9]	0	3

1 Number of data points available for the RPA.
2 If there is a detected value, the highest reported value is summarized in the table. If there are no detected values, the lowest MDL is summarized in the table.
3 Note that the reported MEC does not account for dilution. The RPA does account for dilution; therefore, it is possible for a parameter with an MEC in exceedance of the most stringent criteria not to present a RP (i.e. Endpoint 2).
4 End Point 1 – RP determined, limit required, monitoring required.
End Point 2 – Discharger determined not to have RP, monitoring may be established.
End Point 3 – RPA was inconclusive, carry over previous limitations if applicable, and establish monitoring.
5 Based on the 6-Month Median in the Table 1 of the Ocean Plan.
6 Background concentrations contained in Table 3 of the Ocean Plan.
7 Based on the Daily Maximum in Table 1 of the Ocean Plan.
8 Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, section 30253 of the CCR. Levels of radioactivity that exceed the applicable criteria are not expected in the discharge.
9 Based on 30-Day Average in Table 1 of the Ocean Plan.
10 The Facility does not add or otherwise use chlorine in its process.
11 Four of the 11 reported acute toxicity measurements were recorded as 0 TUa. These data points were not included in the RPA since several steps require the log transformation of the reported data. Inclusion of these data points would decrease the likelihood of determining an Endpoint 1 for acute toxicity and increase the likelihood of determining Endpoint 2; therefore, there exclusion does not bias the result of the RPA.
12 As defined in Appendix A.
13 The data range for bis (2-ethylhexyl) phthalate was evaluated from March 2015 through October 2017.

Consistent with 40 CFR 122.44(I)(2)(i)(B), effluent limitations from Order No. R9-2006-0065 will not be retained for constituents for which there is no reasonable potential (i.e. results with Endpoint 2.) Instead, performance goals have been assigned for these constituents. Parameters with Endpoint 2 are determined not to have reasonable potential, thus establishing effluent limitations is inappropriate for these parameters.

For parameters for which Endpoint 3 was concluded, reasonable potential was inconclusive. For parameters for which Endpoint 3 was concluded and previous effluent limitations had not been established, performance goals have been retained. The MRP (Attachment E) is intended to facilitate collection of additional information for these constituents to determine if reasonable potential exists in future permit reissuances and/or updates.

Reasonable potential to cause or contribute to an exceedance of water quality objectives contained within the Ocean Plan (i.e., Endpoint 1) was determined for Chronic Toxicity and TCDD equivalents, thus effluent limitations for Chronic Toxicity and TCDD equivalents have been established in this Order based on the initial dilution of 21.83 to 1, as discussed below.

The MRP (Attachment E) is designed to obtain additional information for these constituents to determine if reasonable potential exists for these constituents in future permit renewals and/or updates.

4. WQBEL and Performance Goal Calculations

a. From the Table 1 water quality objectives of the Ocean Plan, effluent limitations and performance goals are calculated according to the following equation for all pollutants, except for toxicity, radioactivity, and salinity:

Ce = Co + Dm (Co – Cs) where:

Ce = the effluent limitation (µg/L)
Co = the water quality objective to be met at the completion of initial dilution (µg/L)
Cs = background seawater concentration (µg/L)
Dm = minimum probable initial dilution expressed as parts seawater per part wastewater

b. Initial dilution (Dm) has been determined to be 21.83 to 1 by the Discharger through the application of U.S. EPA's dilution model, Visual Plumes.

c. Table 3 of the Ocean Plan establishes background concentrations for some pollutants to be used when determining reasonable potential (represented as "Cs"). In accordance with implementing procedures for Table 1 of the Ocean Plan, Cs equals zero for all pollutants not established in Table 3 of the Ocean Plan. The background concentrations provided in Table 3 of the Ocean Plan are summarized below:

Table F-10. Pollutants Having Background Concentrations

Pollutant	Background Seawater Concentration
Arsenic	3 µg/L
Copper	2 µg/L
Mercury	0.0005 µg/L
Silver	0.16 µg/L
Zinc	8 µg/L

d. As an example, performance goals for cyanide are determined as follows.

Water quality objectives from the Ocean Plan for cyanide are:

Table F-11. Example Parameter Water Quality Objectives

Parameter	Units	6-Month Median	Daily Maximum	Instantaneous Maximum
Cyanide	µg/L	1	4	10

Using the equation, Ce = Co + Dm (Co – Cs), effluent limitations/performance goals are calculated as follows:

Cyanide

Ce = 1 + 21.83 (1 – 0) = 22.83 (6-Month Median)
Ce = 4 + 21.83 (4 – 0) = 91.32 (Daily Maximum)
Ce = 10 + 21.83 (10 – 0) = 228.3 (Instantaneous Maximum)

Based on the implementing procedures described above, effluent limitations and performance goals have been calculated for all Table 1 pollutants from the California Ocean Plan and incorporated into this Order.

e. Section 122.45(f)(1) of 40 CFR requires that effluent limitations be expressed in terms of mass, with some exceptions, and 40 CFR section 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In addition, pursuant to the exceptions to mass limitations provided in 40 CFR section 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g., California Toxics Rule (CTR) criteria and Maximum Contaminant Levels) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations were calculated using the following equation:

MER (lbs/day) = Permitted Flow (MGD) x Pollutant Concentration (mg/L) x 8.34

f. Based on the results of the RPA, a summary of the WQBELs established in this Order are provided below:

Table F-12. Summary of Water Quality-based Effluent Limitations (WQBELs)

Parameter	Unit	Effluent Limitations			
		6-Month Median	Maximum Daily	Instantaneous Maximum	30-Day Average
OBJECTIVES FOR PROTECTION OF MARINE AQUATIC LIFE					
Chronic Toxicity	Pass/Fail	--	Pass	--	--
OBJECTIVES FOR PROTECTION OF HUMAN HEALTH - CARCINOGENS					
TCDD Equivalents	µg/L	--	--	--	8.90E-08
	lbs/day[1]	--	--	--	1.77E-07

[1] Calculated based on a flow of 238 MGD.

g. A summary of the performance goals is provided in Table F-13 of this Fact Sheet. Performance goals are calculated for monitoring location M-001 using the design capacity of 238 MGD.

Table F-13. Summary of Performance Goals[1]

Parameter	Unit[3]	Performance Goals[2]			
		6-Month Median	Maximum Daily	Instantaneous Maximum	Average Monthly
OBJECTIVES FOR PROTECTION OF MARINE AQUATIC LIFE					
Arsenic, Total Recoverable	µg/L	1.2E+02	6.7E+02	1.8E+03	--
	lbs/day	2.38E+02	1.32E+03	3.50E+03	--
Cadmium, Total Recoverable	µg/L	2.28E+01	9.13E+01	2.28E+02	--
	lbs/day	4.53E+01	1.81E+02	4.53E+02	--
Chromium VI[3]	µg/L	4.57E+01	1.83E+02	4.57E+02	--
	lbs/day	9.06E+01	3.63E+02	9.06E+02	--
Copper, Total Recoverable	µg/L	2.48E+01	2.30E+02	6.41E+02	--
	lbs/day	4.93E+01	4.57E+02	1.27E+03	--
Lead, Total Recoverable	µg/L	4.57E+01	1.83E+02	4.57E+02	--
	lbs/day	9.06E+01	3.63E+02	9.06E+02	--
Mercury, Total Recoverable	µg/L	9.02E-01	3.64E+00	9.12E+00	--
	lbs/day	1.79E+00	7.23E+00	1.81E+01	--
Nickel, Total Recoverable	µg/L	1.14E+02	4.57E+02	1.14E+03	--
	lbs/day	2.27E+02	9.06E+02	2.27E+03	--
Selenium, Total Recoverable	µg/L	3.42E+02	1.37E+03	3.42E+03	--
	lbs/day	6.80E+02	2.72E+03	6.80E+03	--
Silver, Total Recoverable	µg/L	1.25E+01	6.04E+01	1.56E+02	--
	lbs/day	2.48E+01	1.20E+02	3.10E+02	--
Zinc, Total Recoverable	µg/L	2.82E+02	1.65E+03	4.39E+03	--
	lbs/day	5.60E+02	3.28E+03	8.72E+03	--
Cyanide, Total Recoverable	µg/L	2.28E+01	9.13E+01	2.28E+02	--
	lbs/day	4.53E+01	1.81E+02	4.53E+02	--
Total Chlorine Residual	µg/L	4.57E+01	1.83E+02	1.37E+03	--
	lbs/day	9.06E+01	3.63E+02	2.72E+03	--
Ammonia (expressed as nitrogen)	µg/L	1.37E+04	5.48E+04	1.37E+05	--
	lbs/day	2.72E+04	1.09E+05	2.72E+05	--
Phenolic Compounds (non-chlorinated)	µg/L	6.85E+02	2.74E+03	6.85E+03	--
	lbs/day	1.36E+03	5.44E+03	1.36E+04	--
Chlorinated Phenolics	µg/L	2.28E+01	9.13E+01	2.28E+02	--
	lbs/day	4.53E+01	1.81E+02	4.53E+02	--
Endosulfan	µg/L	2.05E-01	4.11E-01	6.16E-01	--
	lbs/day	4.08E-01	8.16E-01	1.22E+00	--
Endrin	µg/L	4.57E-02	9.13E-02	1.37E-01	--
	lbs/day	9.06E-02	1.81E-01	2.72E-01	--
HCH	µg/L	9.13E-02	1.83E-01	2.74E-01	--
	lbs/day	1.81E-01	3.63E-01	5.44E-01	--

Parameter	Unit[3]	Performance Goals[2]			
		6-Month Median	Maximum Daily	Instantaneous Maximum	Average Monthly
Radioactivity	pCi/L	Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, section 30253 of the CCR, Reference to section 30253 is prospective, including future changes to any incorporated provisions of federal law, as the changes take effect.			
OBJECTIVES FOR PROTECTION OF HUMAN HEALTH – NONCARCINOGENS					
Acrolein	µg/L	--	--	--	5.02E+03
	lbs/day	--	--	--	9.97E+03
Antimony	µg/L	--	--	--	2.74E+04
	lbs/day	--	--	--	5.44E+04
Bis(2-chloroethoxy) Methane	µg/L	--	--	--	1.00E+02
	lbs/day	--	--	--	1.99E+02
Bis(2-chloroisopropyl) Ether	µg/L	--	--	--	2.74E+04
	lbs/day	--	--	--	5.44E+04
Chlorobenzene	µg/L	--	--	--	1.30E+04
	lbs/day	--	--	--	2.58E+04
Chromium (III)	µg/L	--	--	--	4.34E+06
	lbs/day	--	--	--	8.61E+06
Di-n-butyl Phthalate	µg/L	--	--	--	7.99E+04
	lbs/day	--	--	--	1.59E+05
Dichlorobenzenes	µg/L	--	--	--	1.16E+05
	lbs/day	--	--	--	2.31E+05
Diethyl Phthalate	µg/L	--	--	--	7.53E+05
	lbs/day	--	--	--	1.50E+06
Dimethyl Phthalate	µg/L	--	--	--	1.87E+07
	lbs/day	--	--	--	3.72E+07
4,6-dinitro-2-methylphenol	µg/L	--	--	--	5.02E+03
	lbs/day	--	--	--	9.97E+03
2,4-dinitrophenol	µg/L	--	--	--	9.13E+01
	lbs/day	--	--	--	1.81E+02
Ethylbenzene	µg/L	--	--	--	9.36E+04
	lbs/day	--	--	--	1.86E+05
Fluoranthene	µg/L	--	--	--	3.42E+02
	lbs/day	--	--	--	6.80E+02
Hexachlorocyclopentadiene	µg/L	--	--	--	1.32E+03
	lbs/day	--	--	--	2.63E+03
Nitrobenzene	µg/L	--	--	--	1.12E+02
	lbs/day	--	--	--	2.22E+02
	µg/L	--	--	--	4.57E+01

Parameter	Unit[3]	Performance Goals[2]			
		6-Month Median	Maximum Daily	Instantaneous Maximum	Average Monthly
Thallium, Total Recoverable	lbs/day	--	--	--	9.06E+01
Toluene	µg/L	--	--	--	1.94E+06
	lbs/day	--	--	--	3.85E+06
Tributyltin	µg/L	--	--	--	3.20E-02
	lbs/day	--	--	--	6.34E-02
1,1,1-trichloroethane	µg/L	--	--	--	1.23E+07
	lbs/day	--	--	--	2.45E+07
OBJECTIVES FOR PROTECTION OF HUMAN HEALTH – CARCINOGENS					
Acrylonitrile	µg/L	--	--	--	2.28E+00
	lbs/day	--	--	--	4.53E+00
Aldrin	µg/L	--	--	--	5.02E-04
	lbs/day	--	--	--	9.97E-04
Benzene	µg/L	--	--	--	1.35E+02
	lbs/day	--	--	--	2.67E+02
Benzidine	µg/L	--	--	--	1.58E-03
	lbs/day	--	--	--	3.13E-03
Beryllium	µg/L	--	--	--	7.53E-01
	lbs/day	--	--	--	1.50E+00
Bis(2-chloroethyl) Ether	µg/L	--	--	--	1.03E+00
	lbs/day	--	--	--	2.04E+00
Bis(2-ethylhexyl)phthalate	µg/L	--	--	--	7.99E+01
	lbs/day	--	--	--	1.59E+02
Carbon Tetrachloride	µg/L	--	--	--	2.05E+01
	lbs/day	--	--	--	4.08E+01
Chlordane	µg/L	--	--	--	5.25E-04
	lbs/day	--	--	--	1.04E-03
Chlorodibromomethane	µg/L	--	--	--	1.96E+02
	lbs/day	--	--	--	3.90E+02
Chloroform	µg/L	--	--	--	2.97E+03
	lbs/day	--	--	--	5.89E+03
DDT	µg/L	--	--	--	3.88E-03
	lbs/day	--	--	--	7.70E-03
1,4-dichlorobenzene	µg/L	--	--	--	4.11E+02
	lbs/day	--	--	--	8.16E+02
3,3'-dichlorobenzidine	µg/L	--	--	--	1.85E-01
	lbs/day	--	--	--	3.67E-01
1,2-dichloroethane	µg/L	--	--	--	6.39E+02
	lbs/day	--	--	--	1.27E+03

Parameter	Unit[3]	Performance Goals[2]			
		6-Month Median	Maximum Daily	Instantaneous Maximum	Average Monthly
1,1-dichloroethylene	µg/L	--	--	--	2.05E+01
	lbs/day	--	--	--	4.08E+01
Dichlorobromomethane	µg/L	--	--	--	1.42E+02
	lbs/day	--	--	--	2.81E+02
Dichloromethane	µg/L	--	--	--	1.03E+04
	lbs/day	--	--	--	2.04E+04
1,3-dichloropropene	µg/L	--	--	--	2.03E+02
	lbs/day	--	--	--	4.03E+02
Dieldrin	µg/L	--	--	--	9.13E-04
	lbs/day	--	--	--	1.81E-03
2,4-dinitrotoluene	µg/L	--	--	--	5.94E+01
	lbs/day	--	--	--	1.18E+02
1,2-diphenylhydrazine	µg/L	--	--	--	3.65E+00
	lbs/day	--	--	--	7.25E+00
Halomethanes	µg/L	--	--	--	2.97E+03
	lbs/day	--	--	--	5.89E+03
Heptachlor	µg/L	--	--	--	1.14E-03
	lbs/day	--	--	--	2.27E-03
Heptachlor Epoxide	µg/L	--	--	--	4.57E-04
	lbs/day	--	--	--	9.06E-04
Hexachlorobenzene	µg/L	--	--	--	4.79E-03
	lbs/day	--	--	--	9.52E-03
Hexachlorobutadiene	µg/L	--	--	--	3.20E+02
	lbs/day	--	--	--	6.34E+02
Hexachloroethane	µg/L	--	--	--	5.71E+01
	lbs/day	--	--	--	1.13E+02
Isophorone	µg/L	--	--	--	1.67E+04
	lbs/day	--	--	--	3.31E+04
N-nitrosodimethylamine	µg/L	--	--	--	1.67E+02
	lbs/day	--	--	--	3.31E+02
N-nitrosodi-N-propylamine	µg/L	--	--	--	8.68E+00
	lbs/day	--	--	--	1.72E+01
N-nitrosodiphenylamine	µg/L	--	--	--	5.71E+01
	lbs/day	--	--	--	1.13E+02
PAHs	µg/L	--	--	--	2.01E-01
	lbs/day	--	--	--	3.99E-01
PCBs	µg/L	--	--	--	4.34E-04
	lbs/day	--	--	--	8.61E-04

Parameter	Unit[3]	Performance Goals[2]			
		6-Month Median	Maximum Daily	Instantaneous Maximum	Average Monthly
1,1,2,2-tetrachloroethane	µg/L	--	--	--	5.25E+01
	lbs/day	--	--	--	1.04E+02
Tetrachloroethylene	µg/L	--	--	--	4.57E+01
	lbs/day	--	--	--	9.06E+01
Toxaphene	µg/L	--	--	--	4.79E-03
	lbs/day	--	--	--	9.52E-03
Trichloroethylene	µg/L	--	--	--	6.16E+02
	lbs/day	--	--	--	1.22E+03
1,1,2-trichloroethane	µg/L	--	--	--	2.15E+02
	lbs/day	--	--	--	4.26E+02
2,4,6-trichlorophenol	µg/L	--	--	--	6.62E+00
	lbs/day	--	--	--	1.31E+01
Vinyl Chloride	µg/L	--	--	--	8.22E+02
	lbs/day	--	--	--	1.63E+03

[1] See Attachment A for definitions, abbreviations, and a glossary of common terms used in this Order.
[2] Scientific "E" notation is used to express certain values. In scientific "E" notation, the number following the "E" indicates that position of the decimal point in the value. Negative numbers after the "E" indicate that the value is less than 1, and positive numbers after the "E" indicate that the value is greater than 1. In this notation a value of 6.1E-02 represents 6.1×10^{-2} or 0.061, 6.1E+02 represents 6.1×10^{2} or 610, and 6.1E+00 represents 6.1×10^{0} or 6.1.
[3] The MER, in lbs/day, is calculated based on the following equation:
MER (lbs/day) = 8.34 x Q x C, where Q is the flow rate of 238 MGD and C is the concentration in mg/L.
[4] The Discharger may, at their option, apply this performance goal as a total chromium performance goal.

5. Water Quality Limitations for Salinity

Chapter III.M.3.b of the Ocean Plan requires the inclusion of an effluent limitation necessary to meet the receiving water limitation of a daily maximum of 2.0 ppt above natural salinity at the edge of a 100-meter brine mixing zone (BMZ) measured horizontally from the discharge point. There is no vertical limit to this zone.

Chapter III.M.3.d of the Ocean Plan allows for facilities to receive a BMZ of up to 200 meters laterally from the discharge point that (a) have received a conditional Water Code section 13142.5(b) determination, (b) are over 80 percent constructed by the effective date of the Desalination Amendment, and (c) propose flow augmentation using a surface water discharge. To receive the 200-meter BMZ, the Discharger must demonstrate that the combination of the expanded BMZ and flow augmentation using a surface water intake provide a comparable level of intake and mortality of all forms of marine life as the combination of the 100-meter BMZ and wastewater dilution if wastewater is available, or multiport diffusers if wastewater is unavailable. Additionally, the discharge shall not result in hypoxic conditions outside the BMZ.

The Facility meets the requirements to apply for an expanded BMZ of up to 200 meters because: (a) the Facility has previously received a conditional Water Code section 13142.5(b) determination, (b) the Facility was over 80 percent constructed prior to the effective date of the Desalination Amendment, and (c) the Discharger proposes flow augmentation using a surface water discharge.

The Discharger submitted an entrainment study, based on Tenera Environmental' s 2008 Encina Power Station *Clean Water Act Section 316(b) Impingement Mortality and Entrainment Characterization Study,* as Appendix K of the 2015 ROWD. The Discharger subsequently revised the entrainment effects calculations as recommended by the Science Advisory Panel (SAP) and provided the results as Appendices FFF and GGG to the ROWD. The studies found that for this Facility, flow augmentation with a surface water intake and an expanded BMZ of 200 meters is more protective than a 100-meter BMZ using a multiport diffuser. The study found that the use of wastewater was infeasible due to limited flow for dilution and limited capacity at any nearby existing wastewater outfalls.

Appendix BB of the 2015 ROWD concludes that a 200-meter BMZ, with a minimum dilution of 3.31:1 in the ocean for the diluted effluent, is needed to achieve the salinity receiving water limitation. Consistent with chapter III.M.3.d of the Ocean Plan, this Order establishes an expanded BMZ of 200 meters.

In determining the effluent limit(s) necessary to meet the receiving water limitation at the edge of the BMZ, the Ocean Plan establishes the following formula:

Ce = (2.0 ppt + Cs) + Dm(2.0 ppt)

Where:

Ce = the maximum daily effluent concentration limit in ppt

Co = the salinity concentration to be met at the BMZ; i.e. Co = 2.0 ppt + Cs

Cs = the natural background salinity (defined as a 20 year monthly mean)

Dm = minimum probable initial dilution expressed as parts seawater per part brine discharge

Natural background salinity at Scripps Pier in San Diego was recorded from 1993 through 2012, and the monthly means were calculated and established. The monthly means ranged from 33.4 ppt through 33.7 ppt. Using the lowest background salinity (applicable for January, February, and March; representative of the most conservative limitation), the following salinity effluent limitation would result:

Ce = (2.0 ppt + 33.4 ppt) + 3.31(2.0 ppt) = 42.0 ppt.

The Discharger has confirmed that the diluted effluent will not exceed 42.0 ppt, and the supporting studies (antidegradation analysis, hydrodynamic discharge study, acute and chronic tolerance studies[1]) are based on an effluent concentration not to exceed 42.0 ppt. Further, the Discharger specifically proposed an effluent limitation of 42.0 ppt within their *Hydrodynamic Discharge Study* (Appendix C and revised in Appendices BB and VV of the 2015 ROWD), which is representative of a dilution of 3.31:1, and is anticipated to be protective of water quality and beneficial uses. An effluent limitation of 42.0 ppt is conservative and protective during all months of the year.

Order No. R9-2006-0065 had established an average daily effluent limitation for total dissolved solids (TDS) of 40 ppt and an average hourly limitation of 44 ppt based on a review of technical literature and the assumed water quality impacts. Due to Anti-backsliding regulations, this Order retains these limitations for co-located operations, in addition to the salinity limitations required by the Ocean Plan. The TDS limitations are not retained for stand-alone operations. Stand-alone operations represent a substantial alteration to the permitted Facility and the alteration of the salinity limitation is consistent

[1] These studies are in Appendices G, H, M, BB, and VV of the 2015 ROWD.

with section 402(o)(2) of the CWA. As discussed above, salinity is addressed based on the Ocean Plan salinity receiving water limitation that discharges shall not exceed a daily maximum of 2.0 ppt above natural background salinity at the edge of the BMZ. The implementation of two salinity limitations is duplicative and unnecessary for the protection of water quality. As detailed in the Discharger's antidegradation analysis, a maximum daily effluent limitation of 42.0 ppt is protective of water quality, aquatic life, and beneficial uses.

6. Whole Effluent Toxicity (WET)

a. WET testing protects receiving waters from the aggregate toxic effect of a mixture of pollutants in the effluent. The effluent from the Facility will consist of concentrated pollutants that were present in the influent and pollutants that are introduced as part of the treatment process. Therefore, the Facility's effluent has a potential for toxic constituents in toxic amounts to be present, or could have additive, synergistic, or antagonistic effects.

b. Order No. R9-2006-0065 also established acute toxicity performance goals and monitoring requirements for the discharge. An acute toxicity test is conducted over a short time period and measures mortality of marine species. A chronic toxicity test is conducted over a longer exposure period of time and may measure mortality, reproduction, and growth. A chemical at a low concentration could have chronic effects but no acute effects until the chemical is at a higher concentration. Thus, chronic toxicity is a more stringent requirement than acute toxicity. This Order removes performance goals and monitoring requirements for acute toxicity and retains effluent limitations and monitoring requirements for chronic toxicity. Removal of the numeric acute toxicity performance goals does not constitute backsliding because chronic toxicity is a more stringent requirement than acute toxicity. Effluent limitations for chronic toxicity are necessary, feasible, and appropriate because effluent data exhibited reasonable potential to cause or contribute to an exceedance of the toxicity water quality objectives.

c. Order No. R9-2006-0065 established effluent limitations and monitoring requirements for chronic toxicity. Using the RPA procedures outlined in the Ocean Plan, the effluent demonstrated reasonable potential to cause an exceedance of the narrative water quality objective for chronic toxicity (i.e., Endpoint 1). Therefore, this Order retains effluent limitations and monitoring for chronic toxicity. Monitoring for chronic toxicity at M-001 will be conducted as specified in the MRP, Attachment E and compared to the MDEL for informational purposes only using an IWC of 4.38% effluent for the discharge at that location. Monitoring for chronic toxicity at M-002 will be conducted as specified in the MRP, Attachment E for effluent compliance purposes with the MDEL for chronic toxicity using an IWC of 17.4% effluent for the discharge at that location.

Compliance with this chronic toxicity effluent limitation shall be evaluated using the Test of Significant Toxicity (TST) statistical approach at the discharge "in-stream" waste concentration (IWC), as described in section VII.L of this Order and section III.C of the MRP (Attachment E). The TST statistical approach is described in the *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, 2010), Appendix A, Figure A-1 and Table A-1. The TST null hypothesis shall be "mean discharge IWC response ≤ 0.75 × mean control response." A test that rejects this null hypothesis shall be reported as

"pass." A test that does not reject this null hypothesis shall be reported as "fail." Discharger shall also report the "percent effect" as part of chronic toxicity result.

Section III.F of the Ocean Plan provides for more stringent requirements if necessary, to protect the designated beneficial uses of ocean waters. Diamond *et al.* (2013) examined the side-by-side comparison of No-Observed-Effect-Concentration (NOEC) and TST results using California chronic toxicity test data for the West Coast marine methods and test species required under this Order. See Table 1 (method types 1 through 5) on page 1103 in Diamond J, Denton D, Roberts J, Zheng L. 2013. *Evaluation of the Test of Significant Toxicity for Determining the Toxicity of Effluents and Ambient Water Samples* (Environ Toxicol Chem 32:1101-1108). This comparison shows that while the TST and NOEC statistical approaches perform similarly most of the time, the TST performs better in identifying toxic and nontoxic samples, a desirable characteristic for chronic toxicity testing conducted under this Order. This examination also signals that the test methods' false positive rate (β no higher than 0.05 at a mean effect of 10%) and false negative rate (α no higher than 0.05 (0.25 for topsmelt) at a mean effect of 25%) are indeed low. This highlights that using the TST in this Order - in conjunction with other Ocean Plan requirements (West Coast WET method/test species for monitoring and limiting chronic toxicity, the IWC representing the critical condition for water quality protection, the initial dilution procedure, and a single test for compliance) - provides increased assurance that statistical error rates are more directly addressed and accounted for in decisions regarding chronic toxicity in the discharge. As a result, and in accordance with Ocean Plan section III.F, the San Diego Water Board is exercising its discretion to use the TST statistical approach for this discharge.

This Order contains a reopener at section VI.C.1.c.vii allowing the San Diego Water Board to reopen and modify the Order, if necessary, to make requirements consistent with any new statewide plan or amendment to a plan adopted by the State Water Board for assessing the toxicity of effluent or receiving waters.

d. The Ocean Plan's approach to chronic toxicity WQBELs is based on a "toxic unit" derived from one multi-concentration toxicity test. In 2010, U.S. EPA endorsed the TST statistical approach in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, 2010) used in this NPDES permit. Compliance with the chronic toxicity maximum daily effluent limitation (MDEL) shall be evaluated using the TST statistical approach at the discharge IWC, as described in section VII.L of the Order and in section III.C of the MRP (Attachment E). The TST statistical approach is described in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, 2010), Appendix A, Figure A-1 and Table A-1.

In January 2010, U.S. EPA published a guidance document titled *EPA Regions 8, 9 and 10 Toxicity Training Tool*, which among other things discusses permit limitation expression for chronic toxicity. The document acknowledges that NPDES regulations at 40 CFR section 122.45(d) require that all permit limits be expressed, unless impracticable, as a maximum daily and average monthly effluent limitation (AMEL) for all dischargers other than publicly owned treatment works. Following section 5.2.3 of the *Technical Support Document for Water Quality-based Toxics Control* (TSD), the use of an AMEL is not appropriate for WET. In lieu of an AWEL and AMEL, U.S. EPA recommends establishing a maximum daily effluent limitation (MDEL) for toxic pollutants and pollutants in water quality permitting, including WET. This is appropriate for two reasons. (1) The basis for the average monthly requirement

derives from secondary treatment regulations and is not related to the requirement to assure achievement of water quality standard. (2) An average weekly and an average monthly requirement comprising up to seven and thirty-one daily samples, respectively, could average out daily peak toxic concentrations for WET and, therefore, the discharge's potential for causing acute and chronic effects would be missed. An AWEL and AMEL for chronic toxicity is impracticable because short-term spikes of toxicity levels that would be permissible under the 7-day and 31-day average scheme, respectively, would not be adequately protective of all beneficial uses. The MDEL is the highest allowable value for the discharge measured during a calendar day or 24-hour period representing a calendar day. This approach is comparable to that of the Ocean Plan, which calls for a chronic toxicity MDEL.

Later, in June 2010, U.S. EPA published another guidance document titled *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, June 2010), in which the following was recommended: "*Permitting authorities should consider adding the TST approach to their implementation procedures for analyzing valid WET data for their current NPDES WET Program*." The TST approach is another statistical option for analyzing valid WET test data. Use of the TST approach does not result in any changes to U.S. EPA's WET test methods. Section 9.4.1.2 of U.S. EPA's *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPA/600/R-95-136, August 1995), recognizes that, "*the statistical methods in this manual are not the only possible methods of statistical analysis*." The TST approach can be applied to acute (survival) and chronic (sublethal) endpoints and is appropriate to use for both freshwater and marine EPA WET test methods.

The U.S. EPA's WET testing program and acute and chronic WET methods rely on the measurement result for a specific test endpoint, not upon achievement of specified concentration-response patterns to determine toxicity. U.S. EPA's WET methods do not require achievement of specified effluent or ambient concentration-response patterns prior to determining that toxicity is present.[2] Nevertheless, U.S. EPA's acute and chronic WET methods require that effluent and ambient concentration-response patterns generated for multi-concentration acute and chronic toxicity tests be reviewed - as a component of test review following statistical analysis - to ensure that the calculated measurement result for the toxicity test is interpreted appropriately. (EPA-821-R-02-012, section 12.2.6.2; EPA-821-R-02-013, section 10.2.6.2). In 2000, U.S. EPA provided guidance for such reviews to ensure that test endpoints for determining toxicity based on the statistical approaches utilized at the time the guidance was written (NOEC, percent waste giving 50 percent survival of test organisms (lethal concentration 50, LC 50), and effects concentration at 25 percent (EC25)) were calculated appropriately (EPA 821-B-00-004).

U.S. EPA designed its 2000 guidance as a standardized step-by step review process that investigates the causes for ten commonly observed concentration-response patterns and provides for the proper interpretation of the test endpoints derived from these patterns for NOECs, LC 50, and EC25, thereby reducing the number of misclassified test results. The guidance provides one of three determinations based on the review steps: (1) that calculated effect concentrations are reliable and should be reported, (2) that calculated effect concentrations are anomalous and should be explained, or (3) that the test was inconclusive and should be repeated with a newly

[2]See, Supplementary Information in support of the Final Rule establishing WET test methods at 67 Fed. Reg. 69952, 69963, Nov. 19, 2002.

collected sample. The standardized review of the effluent and receiving water concentration-response patterns provided by U.S. EPA's 2000 guidance decreased discrepancies in data interpretation for NOEC, LC 50, and EC25 test results, thereby lowering the chance that a truly nontoxic sample would be misclassified and reported as toxic.

Appropriate interpretation of the measurement result from U.S. EPA's TST statistical approach ("pass"/"fail") for effluent and receiving water samples is, by design, independent from the concentration-response patterns of the toxicity tests for those samples. Therefore, when using the TST statistical approach, application of U.S. EPA's 2000 guidance on effluent and receiving waters concentration-response patterns will not improve the appropriate interpretation of TST results as long as all Test Acceptability Criteria and other test review procedures - including those related to quality assurance for effluent and receiving water toxicity tests, reference toxicity tests, and control performance (mean, standard deviation, and coefficient of variation) - described by the WET test methods manual and TST guidance are followed. The 2000 guidance may be used to identify reliable, anomalous, or inconclusive concentration-response patterns and associated statistical results to the extent that the guidance recommends review of test procedures and laboratory performance already recommended in the WET test methods manual. The guidance does not apply to single-concentration (IWC) and control statistical t-tests and does not apply to the statistical assumptions on which the TST is based. The San Diego Water Board will not consider a concentration-response pattern as sufficient basis to determine that a TST t-test result for a toxicity test is anything other than valid, absent other evidence. In a toxicity laboratory, unexpected concentration-response patterns should not occur with any regular frequency and consistent reports of anomalous or inconclusive concentration-response patterns or test results that are not valid will require an investigation of laboratory practices.

Any Data Quality Objectives or Standard Operating Procedure used by the toxicity testing laboratory to identify and report valid, invalid, anomalous, or inconclusive effluent or receiving water toxicity test measurement results from the TST statistical approach which include a consideration of concentration-response patterns and/or Percent Minimum Significant Differences (PMSDs) must be submitted for review by the San Diego Water Board, in consultation with U.S. EPA Region IX, the State Water Board's Quality Assurance Officer, and Environmental Laboratory Accreditation Program (ELAP) (40 CFR section 122.44(h)). As described in the bioassay laboratory audit directives to the San Jose Creek Water Quality Laboratory from the State Water Board dated August 7, 2014, and from the U.S. EPA dated December 24, 2013, the PMSD criteria only apply to compliance for NOEC and the sublethal endpoints of the NOEC, and therefore are not used to interpret TST results.

D. Final Effluent Limitations

The following table lists the final effluent limitations established in this Order. Where this Order establishes mass emission limitations, these limitations have been derived based on a flowrate of 238 MGD.

Table F-14. Effluent Limitations[1]

Parameter	Units[2]	Effluent Limitations					
		Average Monthly	Average Weekly	Average Daily	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids (TSS)	mg/L	60	--	--	--	--	--
	lbs/day	119,095	--	--	--	--	--
pH	standard units	--	--	--	--	6.0	9.0
Oil and Grease	mg/L	25	40	--	--	--	75
	lbs/day	49,623	79,397	--	--	--	148,869
Settleable Solids	ml/L	1.0	1.5	--	--	--	3.0
Turbidity	NTU	75	100	--	--	--	225
Salinity	ppt[3]	--	--	42	--	--	--
OBJECTIVES FOR PROTECTION OF MARINE AQUATIC LIFE							
Chronic Toxicity[4]	Pass/Fail	--	--	--	Pass[6]	--	--
OBJECTIVES FOR PROTECTION OF HUMAN HEALTH – CARCINOGENS[1]							
TCDD Equivalents	µg/L	8.90E-08[5]	--	--	--	--	--
	lbs/day	1.77E-07	--	--	--	--	--

1 See Attachment A for definitions, abbreviations, and a glossary of common terms used in this Order.
2 The mass emission rate limitation (MER), in lbs/day, was calculated based on the following equation: MER (lbs/day) = 8.34 x Q x C, where Q is the flow rate of 238 MGD and C is the concentration in mg/L.
3 "ppt" is parts per thousand.
4 As specified in section III.C of the MRP (Attachment E).
5 Scientific "E" notation is used to express the effluent limitations TCDD equivalents. In scientific "E" notation, the number following the "E" indicates that position of the decimal point in the value. Negative numbers after the "E" indicate that the value is less than 1, and positive numbers after the "E" indicate that the value is greater than 1. In this notation a value of 6.1E-02 represents 6.1 x 0.01 or 0.061, 6.1E+02 represents 6.1 x 10^2 or 610, and 6.1E+00 represents 6.1 x 10^0 or 6.1.
6 As recommended in the USEPA's *Technical Support Document for Water Quality-based Toxics Control,* section 5.2.3, the maximum daily effluent limitation for chronic toxicity should be interpreted as signifying the maximum test result for the month

1. Anti-Backsliding Requirements

Sections 402(o) and 303(d)(4) of the CWA and federal regulations at 40 CFR section 122.44(l) prohibit backsliding in NPDES permits (see section III.C.5 of this Fact Sheet). These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed.

As discussed in section IV of this Fact Sheet, all effluent limitations contained in Order No. R9-2006-0065, are at least as stringent as those established in the previous order except for the salinity effluent limitation which is allowed due to a substantial alteration in the Facility's operations and based on new guidance from the State Water Board's Desalination Amendment of the Ocean Plan. The monitoring requirements in the MRP, (Attachment E), are designed to obtain additional information for parameters with performance objectives to determine if reasonable potential exists for these parameters in future permit renewals and/or updates.

Based on all of these considerations, this Order complies with all applicable federal and State anti-backsliding regulations.

2. Antidegradation Policies

WDRs for the Discharger must conform to antidegradation requirements discussed in section III.C.4 of this Fact Sheet. The State antidegradation policy requires that existing high quality waters be maintained unless it is demonstrated that any change is consistent with the maximum benefit to the people of the State, will not unreasonably

effect current and possible beneficial uses, and will not result in water quality less than prescribed in applicable policies.

A comprehensive "complete" antidegradation analysis is required if the proposed change results in a substantial increase in mass emissions of pollutants or if the activity results in significant impact to aquatic life. Complete antidegradation analyses are not required if the change will not result in a significant impact to water quality.

The Discharger has proposed the following changes over the proposed permit term that are subject to an antidegradation review:

- Increasing the discharge volume of RO concentrate from a maximum monthly average flow rate of 54 MGD during co-located operations to a maximum daily flow of 60 MGD during stand-alone operations.
- Increasing the discharge of clarified filter backwash water from 4 MGD to 7 MGD.

The Discharger projects that the RO process will result in 99.6 percent of total dissolved solids (TDS) from the influent to the Facility being discharged to the ocean as RO concentrate. The Discharger also estimates that the concentrations of toxic pollutants in the RO concentrate may increase by approximately 4.8 percent as described in Appendix M to the ROWD. Based on data available to date, the increase in concentration of toxic pollutants in the RO concentrate is not anticipated to result in impacts to the receiving water beneficial uses or aquatic life and is not anticipated to exceed applicable water quality objectives established in Table 1 of the Ocean Plan.

This analysis does not consider the additional dilution provided by initial dilution in the receiving water, under which impacts to the receiving water would be significantly less, and thus providing an additional margin of safety. In addition to the increase in Ocean Plan Table 1 parameters, the operational changes needed for the proposed stand-alone operations are anticipated to increase salinity by approximately 4.8 percent, but salinity mass loading will be reduced by approximately 2.4 percent due to a decrease in dilution water used for flow augmentation as described in Appendix M to the ROWD. Thus, for the consideration of the discharge of the Ocean Plan's Table 1 parameters, the operational changes are consistent with State Water Board Resolution No. 68-16 and federal antidegradation provisions at 40 CFR section 131.12.

The resulting effluent limitation for salinity of 42.0 ppt is consistent with the Ocean Plan, providing for a receiving water salinity of up to 2.0 ppt above ambient at the edge of the BMZ. Based on the Discharger's assessment provided in Appendix M of the 2015 ROWD, under stand-alone operations, with unheated effluent and a negatively buoyant plume, salinities at the ocean bottom at 200 meters from the discharge point are projected to be within 2 ppt of ambient at all times.

As reported, the Discharger has not observed acute toxicity for effluent with salinity ranging from 40 to 42 ppt or chronic toxicity for effluent with salinities below 36 ppt[3]. Thus, the increased salinity discharges are not anticipated to result in acute toxicity within the BMZ, or chronic toxicity at the edge of the zone of initial dilution.

Implementation of proposed stand-alone operations will result in identifiable increases above ambient conditions in the receiving water column salinity within and beyond the 200 meter BMZ. These increases are expected to be compliant with the Ocean Plan's receiving water objectives and beneficial uses, with significant impacts limited to the area within the BMZ resulting in greater than 2 ppt above background. As such, the

[3] Please see Appendices G and H of the 2015 ROWD.

increased salinity due to the operational changes are consistent with State Water Board Resolution No. 68-16 and federal antidegradation provisions at 40 CFR section 131.12.

The Facility's discharge is not anticipated to significantly impact Agua Hedionda Lagoon, with salinities in the lagoon remaining at ambient background levels under all proposed operating conditions.

Based on the Discharger's *Intake/Discharge Feasibility Report*, Appendices B, II, and YY of the 2015 ROWD, alternative intake and discharge facilities were evaluated, including subsurface intakes, a seafloor infiltration gallery, a lagoon-based seafloor infiltration gallery, discharging to an existing municipal ocean outfall, and a submerged diffuser.

Furthermore, future and expanded operation of the Facility is anticipated to provide:

- Improved sustainable regional water supply reliability of up to 60 MGD of drinking water per day, with a regional asset value of approximately $1 billion.
- A drought-resilient supply source for existing and planned local recycling and reuse projects.
- Decreased regional reliance on imported water supplies from the Sacramento Bay-Delta and the Colorado River, i.e. additional local water source reduces regional needs for imported water.
- Improved potable water quality, the water supply has lower TDS than other imported sources and recycled water which benefits residential, agricultural, and industrial customers.

The cumulative impacts of the proposed changes to the Facility's operations, and the associated discharge flows are not anticipated to significantly impact receiving water quality, will be protective of water quality objectives and beneficial uses, will provide important economic and social development, and are consistent with the maximum benefit to the people of the State. Based on all of these considerations, this Order is consistent with State and federal antidegradation requirements.

3. Stringency of Requirements for Individual Pollutants

This Order contains both TBELs and WQBELs for individual pollutants. The TBELs consist of restrictions on TSS, pH, oil and grease, settleable solids, and turbidity, which are discussed in section IV.B of this Fact Sheet. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. These limitations are not more stringent than required by the CWA.

WQBELs have been derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. The procedures for calculating the individual WQBELs are based on the State Water Board's Ocean Plan, which was approved by U.S. EPA on January 28, 2016. All beneficial uses and water quality objectives contained in the Basin Plan were approved under State law and submitted to and approved by U.S. EPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to U.S. EPA prior to May 30, 2000, but not approved by U.S. EPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 CFR section 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

E. Performance Goals

Constituents that do not have reasonable potential to cause or contribute to an exceedance of water quality standards are assigned performance goals in this Order. Performance goals serve to ensure that the Facility maintains existing effluent quality and supports State and federal antidegradation policies. Additionally, performance goals provide all interested parties with information regarding the expected levels of pollutants in the discharge that should not be exceeded in order to maintain the water quality objectives established in the Ocean Plan. Performance goals are not limitations or standards for the regulation of the discharge. Effluent concentrations above the performance goals will not be considered as violations of the Order but will serve as red flags that indicate water quality concerns. Repeated red flags may prompt the San Diego Water Board to reopen and amend the Order to replace performance goals for constituents of concern with effluent limitations, or the San Diego Water Board may coordinate such actions with the next permit reissuance. A summary of the performance goals is provided in Table F-13 of this Fact Sheet. A minimum probable initial dilution factor of 1:21.83 was used in establishing the performance goals.

F. Interim Effluent Limitations – Not Applicable

G. Intake and Discharge Specifications

Sections IV.C and IV.D of the Order provide narrative requirements for the intake of seawater and the discharge of effluent from the Facility. These provisions of the Order are necessary to implement the requirements specified in the Ocean Plan. The intake specifications implement chapter III.M.2.(d)(1) of the Ocean Plan; and discharge specifications implement chapter III.A.2 of the Ocean Plan.

H. Land Discharge Specifications – Not Applicable

I. Recycling Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

Receiving water limitations in this Order are derived from the water quality objectives for ocean waters established by the Basin Plan and the Ocean Plan. Background salinity values established in the Order are representative of mean monthly background values based on data between 1993 through 2012 at the Scripps Pier reference station. As discussed in section IV.C.5 of the Fact Sheet, a BMZ of 200 meters has been established for evaluating compliance with the applicable salinity receiving water limitations.

Prior to 2009, the San Diego Water Board interpreted the Bacterial Characteristics Water-contact Standards of the Ocean Plan (Receiving Water Limitations section V.A.2 in the Order) to apply only in the zone bounded by the shoreline and a distance 1,000 feet from the shoreline or the 30-foot depth contour, whichever is farther from the shoreline, and within kelp beds. The Ocean Plan provides that these Bacteriological Standards also apply in designated areas outside this zone used for water contact sports, as determined by the San Diego Water Boards (i.e., all waters designated with the REC-1 beneficial use). These designated areas must be specifically defined in the Basin Plan. Because the San Diego Water Board has designated the ocean waters with the REC-1 beneficial use in the Basin Plan, the Ocean Plan Bacterial Standards apply throughout State territorial marine waters in the San Diego Region, which extend from surface to bottom, out to three nautical miles from the shoreline. This interpretation has been confirmed by the U.S. EPA.

VI. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR section 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR section 122.42, are provided in Attachment D of this Order.

Sections 122.41(a)(1) and (b) through (n) of 40 CFR establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) of 40 CFR allows the State to omit or modify conditions to impose more stringent requirements. In accordance with 40 CFR section 123.25, this Order omits federal conditions that address enforcement authority specified in 40 CFR sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions

This Order may be reopened and modified, revoked and reissued, or terminated in accordance with the provisions of 40 CFR parts 122, 123, 124, and 125. The San Diego Water Board may reopen the Order to modify permit conditions and requirements. Causes for modifications include, but are not limited to, increased/ modified receiving water requirements and participation in the Southern California Coastal Water Research Project (SCCWRP) model monitoring program; or the promulgation of new regulations by U.S. EPA, the State Water Board, or the San Diego Water Board, including revisions to the Ocean Plan or Basin Plan.

This Order may be reopened to modify provisions governing compliance with Water Code section 13142.5(b) and the Ocean Plan if the Discharger proposes a change in design or operation of the Facility in a manner that could increase intake or mortality of all forms of marine life, consistent with the Ocean Plan definition of an expanded facility, beyond that which is approved in this Water Code section 13142.5(b) ~~d~~Determination. Causes for modifications to the Facility operations that are expected to result in an increased intake or mortality of all forms of marine life will require a new Water Code section 13142.5(b) determination by the San Diego Water Board. This Order may also be reopened to modify provisions governing compliance with Water Code section 13142.5(b) and the Ocean Plan if the future event described in the Order at section VI.C.2.a and in Attachment H occurs, requiring a new Water Code section 13142.5(b) determination pursuant to Ocean Plan chapter III.M.2.a.(5). This Order may be reopened at any time for modification of provisions governing compliance with the receiving water limitation for salinity as set forth in Ocean Plan chapter III.M.3.

2. Special Studies, Technical Reports, and Additional Monitoring Requirements

a. Brine Discharge Technology Empirical Study

The Ocean Plan provides that brine discharge technologies other than wastewater dilution and multiport diffusers may be used if an owner or operator of a desalination facility can demonstrate to the San Diego Water Board that the technology provides a comparable level of intake and mortality of all forms of marine life as wastewater dilution if wastewater to dilute the facility's brine is available, or multiport diffusers if wastewater is unavailable.

As described in Attachment H to this Order and required by the Ocean Plan, the Discharger evaluated all of the individual and cumulative effects of the proposed flow augmentation discharge method on the intake and mortality of marine life, including

intake-related entrainment, osmotic stress, turbulence that occurs during water conveyance and mixing, and shearing stress at the point of discharge. The Discharger's evaluation has demonstrated to the San Diego Water Board's satisfaction at this time that wastewater dilution is not available, and that, based on available information, flow augmentation provides a comparable level of intake and mortality of all forms of marine life to the level of the multiport diffuser.

As described in Attachment H of this Order, the Water Code section 13142.5(b) determination must address the requirements of chapter III.M.2.d.(2)(c) of the Ocean Plan that when brine discharge technologies other than wastewater dilution and multiport diffusers are used, the Discharger must demonstrate that the alternative technology provides a comparable level of intake mortality as wastewater dilution or multiport diffusers, if feasible. Appendix CC of the 2015 ROWD and Attachment H of this Order conclude that wastewater dilution is not available at this time due to insufficient wastewater flow volumes, necessary capacity restrictions due to wastewater discharges during wet weather, and lack of access to the necessary infrastructure. Thus, for comparison purposes with the flow augmentation discharge method, the Discharger provided an evaluation based on a model multiport diffuser that would be located 4,000 feet offshore. The model multiport diffuser was designed to maximize dilution, minimize the size of the mixing zone, minimize the suspension of benthic sediments, and minimize marine life mortality.

The Discharger ~~evaluated~~ estimated entrainment effects ~~of each~~for the flow augmentation brine discharge alternative, consistent with chapter III.M.2.d.(2)(c)i through iii of the Ocean Plan, in Appendix A and K of the 2015 ROWD on the 2008 *EPS Impingement Mortality and Entrainment Characterization Study* performed by Tenera Environmental. The Discharger revised the entrainment effects calculations from using flow augmentation discharge technology as recommended by the SAP and provided the results as Appendices FFF ~~and GGG~~ to the ROWD. The Discharger revised the entrainment effects calculations from using a multiport diffuser in Appendix GGG, however the multiport diffuser calculations are limited in that marine life data from Pacific Ocean was not available and marine life data from Agua Hedionda Lagoon was used in the calculations. The analysis determined that flow augmentation is at least equivalent when compared to the model multiport diffuser for marine life mortality, based on available information.

The Water Code 13142.5(b) Determination in this Order is made conditional on the results of the Multiport Diffuser Analysis that the Discharger is required to conduct in section VI.C.2.a of this Order. The Multiport Diffuser Analysis will seek to confirm the San Diego Water Board's conclusion that the intake and mortality of all forms of marine life from flow augmentation and from a multiport diffuser are comparable as required in Ocean Plan chapter III.M.2.d.(2)(c). As explained in Attachment H, the entrainment calculations for a multiport diffuser performed by Tenera Environmental and provided in Appendix GGG do not include the necessary marine life larval length data from the open ocean coastal location where a hypothetical multiport diffuser would be located. As such, the entrainment calculations for a multiport diffuser in the Pacific Ocean inappropriately used marine life data from Agua Hedionda Lagoon rather than from the Pacific Ocean. The Discharger is required to conduct the Multiport Diffuser Analysis to confirm the San Diego Water Board's conclusion that the intake and mortality of all forms of marine life from flow augmentation and a multiport diffuser are comparable. If the Multiport Diffuser Analysis confirms this Order's conclusion that the two discharge technologies are comparable for purposes

of Ocean Plan chapter III.M.2.d.(2)(c), then the condition will have no further effect. In this case, the results of the Multiport Diffuser Analysis will establish the level of intake and mortality of all forms of marine life for a theoretical multiport diffuser as the benchmark for comparison to the results of the flow augmentation empirical study as required by Ocean Plan chapter III.M.2.d.(2)(c)v. If instead, the Multiport Diffuser Analysis fails to confirm the San Diego Water Board's conclusion of comparability under Ocean Plan chapter III.M.2.d.(2)(c), a new Water Code section 13142.5(b) determination will be required to select an appropriate brine discharge technology for the Facility.

Irrespective of the conclusions of the Discharger's ROWD and Attachment H of this Order, chapter III.M.2.d(2)(c)iv of the Ocean Plan requires that if an alternative brine discharge technology other than wastewater dilution and multiport diffusers (e.g. flow augmentation) is approved and implemented under this Order, an empirical study that evaluates intake and mortality of all forms of marine life associated with the alternative brine discharge technology must be submitted within ~~a designated time frame~~18 months of beginning operation of the alternative brine discharge technology. The requirements for submittal of a Brine Discharge Technology Empirical Study Final Report established in section VI.C.2.b.iii~~a~~ of this Order are in conformance with the requirements mandated by chapter III.M.2.d.(2)~~.~~(c)~~.~~iv of the Ocean Plan. If the Final Report shows that the brine discharge technology results in more intake and mortality of marine life than if the Facility used ~~wastewater dilution or~~ multiport diffusers as described in Finding 31 of Appendix H, then the Discharger must also submit with the Final Report a proposed schedule to either:

i. Cease using the alternative brine discharge technology and install and use wastewater dilution or multiport diffusers to discharge brine waste; *or*

ii. Re-design the alternative brine discharge technology system to minimize intake and mortality of all forms of marine life to a level that is comparable with wastewater dilution if wastewater is available or multiport diffusers if wastewater is unavailable, subject to San Diego Water Board approval.

~~At the time of this Order's adoption with the Water Code section 13142.5(b) determination, the San Diego Water Board is aware of a study by Dr. Philip Roberts, *Brine Diffusers and Shear Mortality*[4] April 2018 (Roberts report), that estimates the marine life mortality from a brine discharge through a multiport diffuser. As such, the Discharger's Brine Discharge Technology Empirical Study should include an analysis of the marine life impacts caused by brine discharged through multiport diffusers using the Roberts study. Poseidon may choose to include additional information for the San Diego Water Boards review, as warranted, in addition to an analysis using the Roberts study. The results of such analyses are subject to further review by the San Diego Water Board following Poseidon's submittal.~~

3. Receiving Water Violation Assessment

In the event of a violation of any receiving water limitation established within this Order, the San Diego Water Board may require the Discharger to perform a special study to investigate the nature and cause of the receiving water violation. The receiving water study shall identify measures needed to ensure future compliance with receiving water limitations. The Discharger shall submit the required study to the San Diego Water

[4] ~~Brine Diffusers and Shear Mortality, Philip J.W. Roberts, April 18, 2018 is available at this website:~~ https://www.waterboards.ca.gov/santaana/water_issues/programs/Wastewater/Poseidon/2018/4-18-18_Diffuser_Analysis_Method.pdf

Board within 90 days of receipt of the San Diego Water Board notification of the need to perform a Receiving Water Violation Study.

4. Marine Life Mitigation Plan

Water Code section 13142.5(b) requires that the best available mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life. The Ocean Plan provides requirements at chapter III.M.2.e. to implement mitigation measures in compliance with Water Code section 13142.5(b). The Ocean Plan provisions require that the Discharger estimate the marine life mortality resulting from construction and operation of the Facility that would occur following implementation of the best available site, design, and technology measures. A summary of the Discharger's estimation of marine life mortality from the best available intake and discharge technology for stand-alone operation is provided in findings 38 through 42 in Attachment H.1.

Based on the Discharger's estimation of marine life mortality, the wetland mitigation area required for marine life mortality impacts related to the Facility's stand-alone operations is 68.30 acres, as described in finding 42 of Attachment H.1. To fulfill the required mitigation acreage, the Discharger has chosen to complete a mitigation project pursuant to chapter III.M.2.e(3) of the Ocean Plan.

The San Diego Water Board has previously approved the Otay River Estuary Restoration Project to provide 66.4 acres of mitigation for the Facility's co-located and temporary stand-alone operations. Pursuant to Chapter III.M.2.e.(7)(a), the San Diego Water Board may account for the previously approved mitigation project. As described in finding 62 in Attachment H.1, the San Diego Water Board has chosen to allow the Discharger to include the previously approved 66.4 acre mitigation project towards the required 68.3 acres of mitigation required to offset marine life and habitat impacts attributable to the construction and operation of the Facility including Design Alternative 21. Therefore, the Discharger must provide an additional 1.9 acres of mitigation either through expansion of the approved mitigation project or through a separate mitigation project.

Section VI.C.2.d~~c~~ of the Order requires an updated Marine Life Mitigation Plan to ensure adequate mitigation is provided in compliance with the Ocean Plan and Water Code section 13142.5(b). To accomplish this, the Order requires an evaluation of the existing approved mitigation project (i.e. the Otay River Estuary Restoration Project) to determine if the additional required 1.9 acres of mitigation can be provided. If the existing mitigation project is not projected to provide the additional required mitigation, the Discharger must submit a plan to provide the additional mitigation. In addition, the Marine Life Mitigation Plan must demonstrate a means to account for the temporal loss of marine life that has occurred from the time that the Facility commenced operation to such time that the completed mitigation project meets performance standards.

Additional information regarding the mitigation requirements for the project is available in finding 62 of Attachment H.1.

5. Climate Action Plan

The Discharger is currently implementing an Energy Minimization and Green House Gas Reduction Plan ("GHG Plan") that the California Coastal Commission approved in 2008 to ensure that the Facility is not directly, or indirectly, contributing to climate change. While the operation of the Facility does not result in the direct emission of greenhouse gasses, the Discharger currently purchases electricity from San Diego Gas & Electric

that indirectly contributes to emissions of greenhouse gasses. Under the terms of the GHG Plan, the Discharger is required to take all reasonable steps to minimize energy consumption and offset 100% of the indirect greenhouse gas emissions attributable to facility operations such that facility operations are "net carbon neutral" for the life of the project. The Discharger has purchased sufficient carbon offsets to fully offset the indirect greenhouse gas emissions associated with facility operations through 2021.

The Discharger's Energy Minimization and Green House Gas Reduction Plan may address some of the Climate Change Action Plan (CCAP) elements required by section IV.C.2.d of this Order to be submitted within three years of the effective date of this Order. Changing climate conditions may fundamentally alter the way desalination plants are designed and operated. Climate change research indicates the overarching driver of change is increased atmospheric carbon dioxide (CO2) from human activity. The increased CO2 emissions trigger changes to climatic patterns, which increase the intensity of sea level rise and coastal storm surges (Δ Sea Level), lead to more erratic rainfall and local weather patterns (Δ Weather Patterns), trigger a gradual warming of freshwater and ocean temperatures (Δ Water Temperature) and trigger changes to ocean water chemistry (Δ Water pH).

C. Best Management Practices and Pollution Prevention

Section IV.C.3.b of the Order requires that consistent with 40 CFR section 122.44(k), the Discharger shall continue to maintain and implement a Best Management Practices (BMP) Plan describing site-specific plans, procedures, and practices planned or implemented to prevent or minimize, the potential for release of significant amounts of toxic or hazardous pollutants to waters of the U.S. and/or State through normal operations and ancillary activities, including, but not limited to standard operating procedures. The BMP Plan must be developed in accordance with the *U.S. EPA Guidance Manual for Developing Best Management Practices* (EPA 833-B-93-004).

Section VI.C.4 of the Order requires the Discharger to develop and conduct a Pollutant Minimization Program, if needed to comply with the requirements of chapter III.C.9 of the Ocean Plan. The goal of the Pollutant Minimization Program is to reduce all potential sources of a pollutant through pollutant minimization (control) strategies, including pollution prevention measures, in order to maintain the effluent concentration at or below the effluent limitation.

Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The completion and implementation of a Pollution Prevention Plan required in accordance with Water Code section 13263.3(d) would fulfill the Pollution Minimization Program requirements.

D. Construction, Operation, and Maintenance Specifications – Not Applicable

E. Special Provisions for Publicly Owned Treatment Works – Not Applicable

F. Other Special Provisions – Not Applicable

G. Compliance Schedule for Design and Construction of the Stand-Alone Intake Structure

The 2009 Determination was expressly conditioned based on the expectation of the occurrence of a future event: 1) the permanent cessation of power generating activities at the co-located Encina Power Station and 2) the Discharger's submission of a new ROWD to operate Encina Power Station's intake infrastructure and discharge channel independently for the benefit of the Discharger's Facility in a stand-alone capacity. In that event, the 2009 Determination specified that the San Diego Water Board would undertake an additional analysis of the Facility's operation as a stand-alone facility to ensure compliance with Water

Code section 13142.5(b). The San Diego Water Board has undertaken the analysis and concluded in Attachments H.1 and H.2 of this Order that, in order to continue operating the Facility during stand-alone conditions, the Discharger must construct a new intake structure and configuration capable of complying with the requirements of the Ocean Plan and Water Code section 13142.5(b). This new intake structure will supply both the source water for the Facility and also additional seawater to dilute the brine discharge.

The Ocean Plan at chapter III.M.2.a(5)(b) provides that the San Diego Water Board may allow up to five years from the date of the event, i.e. the permanent Encina Power Station shut down, for interim intake operations during stand-alone conditions to continue until the permanent new intake structure and configuration is constructed and operational in compliance with the Water Code section 13142.5(b) ~~d~~Determination. The Ocean Plan also provides that the compliance period is contingent on the San Diego Water Board finding that 1) any water supply interruption resulting from the Facility modifications requires additional time for water users to obtain a temporary replacement supply, or 2) such a compliance period is otherwise in the public interest and reasonably required for modification of the Facility to comply with the ~~d~~Determination.

The San Diego Water Board has concluded that a compliance schedule is in the public interest and reasonably required for design and modification of the Facility's intake structure to comply with Water Code section 13142.5(b) and the requirements of this Order. A compliance schedule is in the public interest, considering the technological, operational, economic, and permitting factors that affect the design, construction and implementation of the modified intake structure and the need to avoid Facility shut down and interruption of public drinking water supply during that period. Without this Facility supplying drinking water to the region, the long-term water supply plans and forecasts would require change and uncertainty exists if a replacement water supply can be secured during a potential five-year shutdown of the Facility. The compliance schedule is expected to provide sufficient time for the Discharger to complete the Multiport Diffuser Analysis required in section VI.C.2.a of the Order prior to initiating construction of the intake structure to provide the flow augmentation dilution water for discharge. Based on these considerations a compliance schedule is provided in section IV.C.7.a, Table 7 of this Order to construct and make operational the required modifications of the Facility's intake structure.

During the compliance period until the new intake structure is constructed and operational, the Facility must implement interim measures to continue operating and supplying drinking water. The Discharger will continue using the existing pumps, screens and intake structure that are currently in place at the Encina Power Station. As soon as possible but not later than April 30, 2020, the Discharger will install new low turbulence, pumps on-shore which should not require extensive permitting or amendments due to their on-shore location. In addition, the Discharger is required to implement measures that will minimize mortality of all forms of marine life until the new intake structure is constructed and operational. During interim operations, when the new pumps are operating and until the new screens for the permanent intake structure are constructed, the Facility will continue using the Encina Power Station's fish screens. The following measures are incorporated in section IV.C.7.c of this Order and are required to be implemented until the new intake structure is constructed and operational:

i. Surface water intakes must be screened using the existing Encina Power Station intake screens, and the screens must be functional while the Facility is withdrawing seawater;

ii. Axial-flow, low-turbulence pumps shall be constructed and made operational as soon as feasible but no later than the date specified in Table 7, Task 2;

iii. The intake of seawater shall be reduced to the minimum volume necessary to maintain Facility operations and to comply with this Order, subject to the operational limitations of the existing pumps prior to the new intake pumps being operational;

iv. To the maximum extent practicable, in-plant recycling of waste streams shall be maximized before intaking additional seawater;

v. The Discharger shall cease intake of seawater except when intake of seawater is necessary to maintain Facility operations or to comply with this Order;

vi. Heat treatment of the intake system is prohibited; and

vii. Pump operations shall minimize abrupt changes in flow velocity, subject to the operational limitations of the existing pumps prior to the new intake pumps being operational.

The compliance schedule is set forth in section VI.C.7 of the Order. This schedule may be modified by the San Diego Water Board upon request from the Discharger, based on issues related to regulatory approval, environmental review, or legal challenges. The tasks and associated due dates are enforceable to the maximum extent allowed by law.

H. Certification Report for New Intake Structure

Section VI.C.8 of the Order requires the Discharger to submit a certification report that the new intake structure will be designed in compliance with the requirements of the Ocean Plan, Water Code section 13142.5(b), and any other applicable requirements of this Order. The Certification must be prepared by a California licensed professional engineer, competent and proficient in the field pertinent to the report and qualified to prepare such a report. A statement of qualification of the responsible lead professional shall be included in the report. The signature and engineering license number of the engineer preparing the certification report shall be affixed to the report. The report must 1) identify the design capacity of the intake structure and screening; 2) certify the adequacy of key components of the intake structure, 3) include a summary of the results of updated studies for implementing wedgewire screens as the intake screening technology for the Facility, 4) contain an engineering analysis to ensure compliance with the requirements of the Ocean Plan, Water Code section 13142.5(b) and this Order; 5) and include the supporting documentation and rationale for the certification. The Certification Report is subject to review by the San Diego Water Board and the new intake structure cannot initiate operation without written authorization from the San Diego Water Board.

I. Certification Report for New Intake Pumps

Section VI.C.9 of the Order requires the Discharger to submit a certification report that the new intake pumps will be designed in compliance with chapter III.M.2.d.(2)(d)(ii) of the Ocean Plan which states:

"At a facility that has received a conditional Water Code section 13142.5(b) determination and is over 80 percent constructed by January 28, 2016. If the owner or operator of the facility proposes to use flow augmentation as an alternative brine discharge technology, the facility must: use low turbulence intakes (e.g., screw centrifugal pumps or axial flow pumps) and conveyance pipes; convey and mix dilution water in a manner that limits thermal stress, osmotic stress, turbulent shear stress, and other factors that could cause intake and mortality of all forms of marine life; comply with chapter III.M.2.d.(1); and not discharge through multiport diffusers."

As explained in Finding 37 of Attachment H.1, the Facility meets the Ocean Plan's criteria for continued use of flow augmentation as an alternative brine discharge technology. The Facility received a conditional Water Code section 13142.5(b) determination in 2009 for co-located operations and temporary stand-alone operations and was over 80 percent constructed by January 28, 2016. The Discharger proposes to retrofit the Facility with new intake pumps that meet the requirements of the Ocean Plan. The certification report required under section VI.C.9 of the Order will ensure that the new intake pumps comply with the provisions of the Ocean Plan and Water Code section 13142.5(b), prior to the new intake pumps beginning operation.

VII. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

CWA section 308 and 40 CFR sections 122.41(h), (j)-(l), 122.44(i), and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the San Diego Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. The MRP (Attachment E) establishes monitoring, reporting, and recordkeeping requirements that implement federal and State requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP (Attachment E) for this Facility.

A. Core Monitoring Requirements

The core monitoring requirements set forth in section III of the MRP (Attachment E to this Order) are designed to measure the characteristics of seawater prior to the desalination treatment process and to determine and quantify contaminants in the effluent. This monitoring is necessary to determine compliance with the Order's prohibitions, limitations, and water quality standards. The overall core monitoring program is intended to answer the following questions:

- Is the intake flow consistent with permit conditions and expectations?
- What is the concentration factor for pollutants within the effluent compared to the influent? Is this consistent with expectations considered during permit development?
- Are intake credits reasonable for future permit development efforts?
- Does the effluent comply with permit effluent limitations, performance goals, and other requirements of this Order, thereby ensuring that water quality standards are achieved in the receiving water?
- What is the mass of constituents that are discharged?
- Is the effluent concentration or mass loading changing over time?
- Is the Facility being properly operated and maintained to ensure compliance with the conditions of the Order?

1. Influent Monitoring Requirements

Influent monitoring is required to determine if the intake flow and the concentration factor for pollutants within the effluent compared to the influent is consistent with permit conditions and expectations. Refer to section III.A of the MRP (Attachment E) for the influent monitoring requirements. Influent monitoring requirements have been carried over from Order No. R9-2006-0065.

2. Effluent Monitoring Requirements

Effluent monitoring is required to determine compliance with the permit conditions, to identify operational problems, to ensure consistent or improved Facility performance, and to conduct reasonable potential analyses for subsequent Orders. Effluent monitoring

also provides information on wastewater characteristics for use in interpreting water quality and biological data. The sample type for non-volatile analytes has been changed from grab to 24-hour composite. This Order clarifies the effluent monitoring when the Facility is not discharging brine.

Refer to section III.B of the MRP (Attachment E) for the effluent monitoring requirements.

3. Whole Effluent Toxicity Testing Requirements

This Order contains chronic toxicity effluent limitations as described in section IV.C.6 of this Fact Sheet. Chronic toxicity limitations have been established in this Order based on U.S. EPA's TST method with a percent effect. As discussed in section IV.C.6 of this Fact Sheet, the monitoring location for WET has been revised from M-001 to M-002 to simplify monitoring requirements, to more accurately reflect the discharge's impact to receiving waters, and to ensure protection of water quality and aquatic life by implementing the WQBELs for toxicity as far downstream as possible, prior to discharge.

This Order requires the Discharger to conduct additional toxicity testing for exceedances of the toxicity effluent limitations. If the additional tests demonstrate toxicity, the Discharger is required to submit an incident specific Toxicity Reduction Evaluation (TRE) work plan in accordance with U.S. EPA guidance which shall include: further steps taken by the Discharger to investigate, identify, and correct the causes of toxicity; actions the Discharger will take to mitigate the effects of the discharge and prevent the recurrence of toxicity; and a schedule for these actions. This provision also includes requirements to conduct the TRE and Toxicity Identification Evaluation (TIE) process in accordance with the submitted work plan if the results of toxicity testing exceed the effluent limitations for toxicity. The rationale for WET testing is discussed in section IV.C.6 of this Fact Sheet.

Refer to section III.B of the MRP (Attachment E) for the effluent monitoring requirements.

Toxicity Reduction Evaluation (TRE)

Section III.C.10 of the Ocean Plan requires a TRE if a discharge consistently exceeds an effluent limitation based on a toxicity objective in Table 1 of the Ocean Plan. Consistent with the requirements of the Ocean Plan, section III.C.6 of the MRP (Attachment E) requires the Discharger to develop an Initial Investigation TRE work plan and submit the TRE work plan within 90 days of the effective date of this Order. The work plan must describe steps the Discharger intends to follow if the effluent limitation for chronic toxicity is exceeded.

If the effluent limitation for chronic toxicity is exceeded in any one test, the Discharger must conduct a TRE if the toxicity is exceeded in any of the next four succeeding tests performed at 14-day intervals and notify the San Diego Water Board. The requirement for a minimum of four succeeding tests performed at 14-day intervals is based on the probability of encountering at least one toxicity exceedance assuming a true, but unknown level of occurrence. After the chronic toxicity exceedance, the Discharger must continue to conduct the routine monthly monitoring for chronic toxicity as required in the MRP (Attachment E). The TRE must be conducted in accordance with the approved TRE work plan and available U.S. EPA guidance. The Discharger must also implement a TIE, as necessary, based upon the magnitude and persistence of toxicity effluent limitation exceedances. Once the source of toxicity is identified, the Discharger must take all reasonable steps to reduce the toxicity to meet the chronic toxicity effluent limitation identified in section IV.A of this Order.

Within 30 days of completion of the TRE, the Discharger must submit the results of the TRE, including a summary of the findings, data generated, a list of corrective actions taken or planned to achieve consistent compliance with all the toxicity limitations of this Order and prevent recurrence of exceedances of those limitations, and a time schedule for implementation of any planned corrective actions. The Discharger must implement any planned corrective actions assigned to the Discharger in the TRE Final Report in accordance with the specified time schedule, unless otherwise directed in writing by the San Diego Water Board. The corrective actions and time schedule must be modified at the direction of the San Diego Water Board.

Refer to section III.B. of the MRP (Attachment E) for the effluent monitoring requirements.

4. Land Discharge Monitoring Requirements – Not Applicable

5. Recycling Monitoring Requirements – Not Applicable

B. Receiving Water Monitoring Requirements

The receiving water and sediment monitoring requirements set forth below are designed to measure the effects of the Facility's discharge on the receiving ocean waters. The overall receiving water monitoring program is intended to answer the following questions:

- Does the receiving water meet water quality standards?
- Are the receiving water conditions getting better or worse over time?
- What is the relative contribution of the Facility's discharge to pollution in the receiving water?
- What are the effects of the discharge on the receiving water?

1. Surf Zone Water Quality Monitoring Requirements

As ocean surface waves come closer to shore they break, forming the foamy, bubbly surface called surf. The region of breaking waves defines the surf zone.

Monitoring of the surf zone is intended to answer the following questions:

- Does the effluent cause or contribute to an exceedance of the water quality standards in the receiving water?

This Order increases the surf zone monitoring frequency from semiannually to quarterly to assess changes in the receiving water due to the shutdown of EPS.

Refer to section IV.A of the MRP (Attachment E) for the surf zone water quality monitoring requirements.

2. Offshore Water Quality Monitoring Requirements

Offshore monitoring extends north and south of the Encina Power Station discharge channel.

Offshore monitoring is necessary to answer the following questions:

- Does the discharge cause an increase in salinity of >2.0 ppt above ambient conditions?
- Does the discharge cause a discoloration of the ocean surface?
- Is the wastewater plume adversely impacting receiving water areas used for swimming, surfing, diving, and shellfish harvesting?

This Order establishes monitoring stations B-10 through B-40 to evaluate compliance with receiving water quality standards. Monitoring station D-10 has been moved to

monitoring station B-10 due to their close proximity. The monitoring frequency at offshore monitoring stations has been increased from semiannually to quarterly. This Order requires measurements of temperature, salinity, pH, dissolved oxygen, and light transmittance to be taken throughout the water column using a CTD profiler. Continuous profiles provide a higher resolution of the conditions in the receiving water.

Refer to section IV.B of the MRP (Attachment E) for the offshore water quality monitoring requirements.

3. Benthic Monitoring Requirements

Sediments integrate constituents that are discharged to the ocean. Most particles that come from the discharge, and any associated contaminants, will eventually settle to the seafloor where they are incorporated into the existing sediments. Sediments can accumulate these particles over the years until the point where sediment quality has degraded, and beneficial uses are impaired. The benthic community is strongly affected by sediment composition and quality and water quality. Because the benthos are dependent on its surroundings, they serve as a biological indicator that reflects the overall conditions of the aquatic environment.

Section IV.C of the MRP (Attachment E) requires periodic assessment of sediment quality to evaluate potential effects of the Facility discharge and compliance with narrative water quality standards specified in the Ocean Plan. The required assessment consists of the measurement and integration of three lines of evidence: 1) physical and chemical properties of seafloor sediments, 2) seafloor sediment toxicity to assess bioavailability and toxicity of sediment contaminants, and 3) ecological status of the biological communities (benthos) that live in or on the seafloor sediments

Benthic monitoring is necessary to answer the following question:

- Is the concentration of substances, set forth in Table 1 of the Ocean Plan for protection of marine aquatic life, in marine sediments at levels which would degrade the benthic community?
- Is the concentration of organic pollutants in marine sediments at levels that would degrade the benthic community?
- Is the sediment quality changing over time?

This Order establishes benthic monitoring requirements at offshore monitoring stations B-00 through B-40, C-10, D-30, D-50 and E-10. Refer to section IV.C of the MRP (Attachment E) for the benthic monitoring requirements.

4. Groundwater – Not Applicable

C. Other Monitoring Requirements

1. Regional Monitoring Requirements

Regional ocean water monitoring provides information about the sources, fates, and effects of anthropogenic contaminants in the coastal marine environment necessary to make assessments over large areas. The large scale assessments provided by regional monitoring describe and evaluate cumulative effects of all anthropogenic inputs and enable better decision making regarding protection of beneficial uses of ocean waters. Regional monitoring data assists in the interpretation of core monitoring studies by providing a more accurate and complete characterization of reference conditions and natural variability. Regional monitoring also leads to methods standardization and improved quality control through intercalibration exercise. The coalitions implementing

regional monitoring enable sharing of technical resources, trained personnel and associated costs. Focusing these resources on regional issues and developing a broader understanding of pollutants effects in ocean waters enables the development of more rapid and effective response strategies. Based on all of these considerations, the San Diego Water Board supports regional approaches to monitoring ocean waters.

The Discharger shall participate with other regulated entities, other interested parties, and the San Diego Water Board in development, refinement, implementation and coordination of regional monitoring and assessment programs for ocean waters in the San Diego Region and discharge to those waters, so as to answer the following questions:

- Determine the status and trends of conditions in ocean waters in the San Diego Region with regard to beneficial uses, e.g.,
  - **i.** Are fish and shellfish safe to eat?
  - **ii.** Is water quality safe for swimming?
  - **iii.** Are ecosystems healthy?
- Identify the primary stressors causing or contributing to conditions of concern;
- Identify the major sources of the stressors causing or contributing to conditions of concern; and
- Evaluate the effectiveness (i.e. environmental outcomes) of actions taken to address such stressors and sources.

During these coordinated sampling efforts, the Discharger's receiving water sampling and analytical effort, as defined in section IV of the MRP (Attachment E), may be reallocated to provide a regional assessment of the impact of the discharge to the ocean. In that event, the San Diego Water Board shall notify the Discharger in writing that the requirement to perform the receiving water sampling and analytical effort defined in section IV of the MRP (Attachment E) is suspended for the duration of the reallocation. Anticipated modifications to the monitoring program will be coordinated so as to provide a more comprehensive picture of the ecological and statistical significance of monitoring results and to determine cumulative impacts of various pollution sources. The level of resources in terms of sampling and analytical effort redirected from the receiving water monitoring program required under section IV of the MRP (Attachment E) shall equal the level of resources provided to implement the regional monitoring and assessment program, unless the San Diego Water Board and the Discharger agree otherwise. The specific scope and duration of the receiving water monitoring program reallocation and redirection shall be determined and set by the San Diego Water Board in consultation with the Discharger. If the Discharger declines to participate in regional monitoring efforts, its ongoing sampling and analytical requirements will remain unchanged

2. Kelp Bed Canopy Monitoring Requirements

Kelp consists of a number of species of brown algae. Along the central and southern California coast, giant kelp (*Macrocystis pyrifera*) is the largest species colonizing rocky, and in some cases sandy, subtidal habitats. Giant kelp is an important component of coastal and island communities in southern California, providing food and habitat for numerous animals. Monitoring of the kelp beds is necessary to answer the following questions:

- What is the maximum areal extent of the coastal kelp bed canopies each year?
- What is the variability of the coastal kelp bed canopy over time?

- Are coastal kelp beds disappearing? If yes, what are factors that could contribute to the disappearance?
- Are new coastal kelp beds forming?

Refer to section V.A of the MRP (Attachment E) for the kelp bed canopy monitoring requirements.

3. Southern California Bight Monitoring

The Southern California Bight (Bight), defined as the concave bend of the shoreline extending from Point Conception to Punta Colonet in Mexico, is host to unique, biologically diverse marine ecosystems that have long been vulnerable to the impacts of human activity. The coastal zone of the Bight hosts nearly 22 million U.S. residents that engage in a wide variety of industrial, military, and recreational activities. Approximately 5,600 miles of watersheds, half of which is highly developed, drain into the Bight. The Southern California Bight Regional Monitoring Program brings together researchers and water-quality managers to pool their resources and work together to investigate the condition of marine ecosystems both spatially and temporally and extend greater protections to the Bight's diverse habitats and natural resources.

The Discharger is required to participate in the Southern California Bight Regional Monitoring Program coordinated by SCCWRP, or any other coordinator named by the San Diego Water Board, pursuant to Water Code sections 13267 and 13383, and 40 CFR section 122.48. The intent of the Southern California Bight Regional Monitoring Program is to maximize the efforts of all monitoring partners using a more cost-effective monitoring design and to best utilize the pooled scientific resources of the Southern California Bight.

During these coordinated sampling efforts, the Discharger's receiving water sampling and analytical effort, as defined in section IV of the MRP (Attachment E), may be reallocated to provide a regional assessment of the impact of the discharge of ~~municipal~~ wastewater to the Southern California Bight. In that event, the San Diego Water Board shall notify the Discharger in writing that the requirement to perform the receiving water sampling and analytical effort defined in section IV of the MRP (Attachment E) is suspended for the duration of the reallocation. Anticipated modifications to the monitoring program will be coordinated so as to provide a more comprehensive picture of the ecological and statistical significance of monitoring results and to determine cumulative impacts of various pollution sources. The level of resources in terms of sampling and analytical effort redirected from the receiving water monitoring program required under section IV of the MRP (Attachment E) shall approximately equal the level of resources provided to implement the regional monitoring and assessment program, unless the San Diego Water Board and the Discharger agree otherwise. The specific scope and duration of the receiving water monitoring program reallocation and redirection shall be determined and set by the San Diego Water Board, in consultation with the Discharger. Refer to section V.B of the MRP (Attachment E).

4. Discharge Monitoring Report – Quality Assurance (DMR-QA) Study Program

Under the authority of section 308 of the CWA (33 U.S.C. section 1318), U.S. EPA requires major and selected minor permittees under the NPDES Program to participate in the annual DMR-QA Study Program. The DMR-QA Study Program evaluates the analytical ability of laboratories that routinely perform or support self-monitoring analyses required by NPDES permits. There are two options to satisfy the requirements of the

DMR-QA Study Program: (1) the Discharger can obtain and analyze a DMR-QA sample as part of the DMR-QA Study; or (2) per the waiver issued by U.S. EPA to the State Water Board, the Discharger can submit the results of the most recent Water Pollution Performance Evaluation Study from its own laboratories or its contract laboratories. A Water Pollution Performance Evaluation Study is similar to the DMR-QA Study. Thus, it also evaluates a laboratory's ability to analyze wastewater samples to produce quality data that ensures the integrity of the NPDES Program. The Discharger shall ensure that the results of the DMR-QA Study or the results of the most recent Water Pollution Performance Evaluation Study are submitted annually to the State Water Board. The State Water Board's Quality Assurance Program Officer will send the DMR-QA Study results or the results of the most recent Water Pollution Performance Evaluation Study to U.S. EPA's DMR-QA Coordinator and Quality Assurance Manager.

D. Other Monitoring Requirements

1. Thermal Plume Monitoring

Thermal Plume Monitoring has not been carried over from Order No. R9-2006-0065. A review of effluent monitoring data demonstrated that the Facility does not appreciably add thermal energy (i.e. increase temperature) to the discharge and no longer requires thermal plume monitoring.

VIII. PUBLIC PARTICIPATION

The San Diego Water Board has considered the issuance of WDRs that will serve as an NPDES permit for the Facility. As a step in the WDR adoption process, the San Diego Water Board staff developed a Tentative Order and encouraged public participation in the proceedings to consider adoption of the Tentative Order in accordance with the requirements of 40 CFR section 124.10 and Water Code section 13167.5.

A. Notification of Interested Parties

The San Diego Water Board notified the Discharger and interested agencies and persons of its intent to prescribe WDR's for the discharge and provided an opportunity to submit written comments and recommendations. By electronic mail dated December 21, 2018, the San Diego Water Board notified the Discharger and interested agencies and persons of its intent to consider adoption of the tentative WDRs and of its intent to conduct a public hearing during a regularly scheduled San Diego Water Board meeting on March 13, 2019. The San Diego Water Board also provided notice that the Tentative Order was posted on the San Diego Water Board website and provided a period of at least 30 days for public review and comment. On December 21, 2018 notice of the public hearing and public comment period was also published in the San Diego Union Tribune, a daily newspaper within the area affected by the Facility. The March 13, 2019 public hearing was rescheduled for the May 8, 2019 San Diego Water Board meeting. On April 5, 2019, notice of the May public hearing was emailed to all interested parties and posted on the San Diego Water Board website. Notice of the May public hearing on the Tentative Order and Tentative Determination was also provided in the Meeting Notice and Agenda for the May 8, 2019 San Diego Water Board meeting, which was posted on the San Diego Water Board website more than 10 days prior to the meeting. The public also had access to the agenda and any changes in dates and locations through the San Diego Water Board's web site at: http://www.waterboards.ca.gov/sandiego/

B. Written Comments

Interested persons were invited to submit written comments concerning tentative WDRs as provided through the notification process. Comments were due either in person or by mail to the Executive Office at the San Diego Water Board at 2375 Northside Drive, Suite 100, San Diego, CA 92108.

To be fully responded to by staff and considered by the San Diego Water Board, the written comments were due at the San Diego Water Board office by 5:00 PM on January 28, 2018. The San Diego Water Board provided written responses to all timely received public comments on the Tentative Order and posted the response to comments document on the Board's website in advance of the public hearing date

C. Public Hearing

The San Diego Water Board held a public hearing on the Tentative Order during its regular Board meeting on the following date and time and at the following location:

Date: Wednesday, ~~March 13~~ May 8, 2019

Time: 9:00 AM
Location: San Diego Water Board
San Diego Water Board Meeting Room
2375 Northside Drive, Suite 100
San Diego, CA 92108

Interested persons were invited to attend the public hearing. At the public hearing, the San Diego Water Board heard testimony pertinent to the discharge and the Tentative Order. For accuracy of the record, important testimony was requested in writing.

D. Reconsideration of Waste Discharge Requirements

Any aggrieved person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., within 30 calendar days of the San Diego Water Board taking action, at the following address except that if the thirtieth day falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Petitions may be sent as follows:

By Mail:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

In Person:

State Water Resources Control Board
Office of Chief Counsel
1001 "I" Street
Sacramento, CA 95814

By email at:
waterqualitypetitions@waterboards.ca.gov

By Fax:
(916) 341-5199

For instructions on how to file a petition for review, see:
http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wqpetition_instr.shtml

E. Information and Copying

The ROWD, other supporting documents, and comments received on the Tentative Order are on file and may be inspected at the address above at any time between 8:00 a.m. and 5:00 p.m., Monday through Friday, except for State holidays. Copying of documents may be arranged through the San Diego Water Board by calling (619) 516-1990.

The San Diego Water Board website contains information and instructions on how to request access and obtain copies of these documents at:
http://www.waterboards.ca.gov/sandiego/about_us/contact_us/records.shtml

Before making a request to view public records in the San Diego Water Board office, interested persons may wish to determine if the information is already available on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego/

F. Register of Interested Parties

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the San Diego Water Board at the address below, reference this Facility, and provide a name, address, email address (if available) and phone number.

2375 Northside Drive, Suite 100
San Diego, CA 92108-2700
Phone (619) 516-1990
Fax (619) 516-1994
rb9_questions@waterboards.ca.gov

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Ben Neill at ben.neill@waterboards.ca.gov or 619-521-1990.

ATTACHMENT G – OCEAN PLAN AND BASIN PLAN PROHIBITIONS

I. Ocean Plan Discharge Prohibitions

A. The Discharge of any radiological chemical, or biological warfare agent or high-level radioactive waste into the ocean is prohibited.

B. Waste shall not be discharged to designated Areas of Special Biological Significance except as provided in chapter III.E of the Ocean Plan.

C. Pipeline discharge of sludge to the ocean is prohibited by federal law; the discharge of municipal and industrial waste sludge directly to the ocean, or into a waste stream that discharges to the ocean, is prohibited. The discharge of sludge digester supernatant directly to the ocean, or to a waste stream that discharges to the ocean without further treatment, is prohibited.

D. The by-passing of untreated wastes containing concentrations of pollutants in excess of those of Table 2 or Table 1 of the Ocean Plan is prohibited.

II. Basin Plan Discharge Prohibitions

A. The discharge of waste to waters of the State in a manner causing, or threatening to cause a condition of pollution, contamination, or nuisance as defined in Water Code section 13050, is prohibited.

B. The discharge of waste to land, except as authorized by WDR's or the terms described in Water Code section 13264 is prohibited.

C. The discharge of pollutants or dredged or fill material to waters of the U.S. except as authorized by an NPDES permit or a dredged or fill material permit (subject to the exemption described in Water Code section 13376) is prohibited.

D. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues an NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State of California Department of Public Health and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

E. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

F. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

G. The dumping, deposition, or discharge of waste directly into waters of the State, or adjacent to such waters in any manner which may permit it's being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

H. Any discharge to a storm water conveyance system that is not composed entirely of storm water is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR section 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR section 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to an NPDES permit and discharges resulting from firefighting activities.] [section 122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

I. The unauthorized discharge of treated or untreated sewage to waters of the State or to a storm water conveyance system is prohibited.

J. The discharge of industrial wastes to conventional septic tank/ subsurface disposal systems, except as authorized by the terms described in Water Code section 13264, is prohibited.

K. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the State is prohibited.

L. The discharge of any radiological, chemical, or biological warfare agent into waters of the State is prohibited.

M. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

N. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the State or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

ATTACHMENTS H.1 & H.2 – OCEAN PLAN DECISION MATRIX AND WATER CODE 13142.5(B) EVALUATION

Attachment H.1 – California Water Code Section 13142.5(b) Determination for Permanent Stand-alone Operations

Poseidon Resources (Channelside) LP (Poseidon or Discharger) is the owner and operator of the Carlsbad Desalination Project (CDP or Facility). The CDP was formerly co-located with the Encina Power Station (EPS), a power plant owned and operated by Cabrillo Power I LLC (Cabrillo). The EPS withdraws water from the Agua Hedionda Lagoon in Carlsbad, California for cooling water through the existing EPS intake structure.

The former co-located CDP operation withdrew source water through the existing EPS discharge structure. The CDP used up to 114 million gallons per day (MGD) of cooling water from the EPS as source water to produce up to 54 MGD of potable drinking water for the San Diego County Water Authority (SDCWA). The remaining 60 MGD of brine waste from the desalination process and other wastewater from the CDP were commingled with the remaining cooling water from the EPS and discharged to the Pacific Ocean. The EPS terminated power generation operations on December 11, 2018. At that time, the CDP commenced withdrawing water from Agua Hedionda Lagoon under stand-alone conditions for its own purposes.

Under the current stand-alone operations as regulated under this Order, CDP intakes source seawater from Agua Hedionda lagoon at a flowrate of 299 MGD. 127 MGD of the source water will be used to produce up to 60 MGD of potable water. The remaining water that is not used for potable water production will be used to dilute the brine wastewater and other wastewater flows for Poseidon to meet the discharge salinity requirements of this Order. The discharge flow rate will vary in accordance with CDP operations. For example, at 50 MGD of potable water production, the discharge flow rate is 249 MGD (54 MGD of wastewater with 195 MGD of dilution water). At 60 MGD of potable water production, the discharge flow rate is 239 MGD (67 MGD of wastewater and 172 MGD of dilution water) into the Pacific Ocean.

California Water Code (Water Code) section 13142.5, subdivision (b) (hereafter Water Code section 13142.5(b)) provides that “For each new or expanded coastal powerplant or other 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.”

The San Diego Water Board adopted Order No. R9-2009-0038 (2009 Determination[1]) on May 13, 2009 amending the National Pollutant Discharge Elimination System (NPDES) Permit, Order No. R9-2006-0065, finding that the CDP complied with Water Code section 13142.5(b) for co-located operations and temporary stand-alone operations. The 2009 Determination concluded that if the EPS permanently ceases power generation operations and Poseidon proposes to independently operate the existing EPS seawater intake and outfall for the benefit of the CDP ("stand-alone operation"), it will be necessary to evaluate whether, under those conditions, the CDP complies with the requirements of Water Code section 13142.5(b) for permanent stand-alone operating conditions. The 2009 Determination also required Poseidon to

[1] Order No. R9-2009-0038 is available on the San Diego Water Board website at: https://www.waterboards.ca.gov/sandiego/board_decisions/adopted_orders/2009/R9-2009-0038.pdf (as of November 15, 2018).

construct 55.4 acres of wetland mitigation to compensate for the intake, entrainment, and mortality of all forms of marine life resulting from co-located and temporary stand-alone CDP operations. The 2009 Determination established a biological performance standard of fish productivity (i.e., the production of new fish biomass) of 1,715.5 kg/year to be achieved in the wetlands mitigation site.

Subsequently, Poseidon reached agreement with the California Coastal Commission (Coastal Commission) to increase the wetland mitigation area to 66.4 acres as a condition of the Commission's Coastal Development Permit. On September 29, 2010, Poseidon and the U.S Fish and Wildlife Service's (USFWS) San Diego Bay National Wildlife Refuge (NWR) entered into a memorandum of understanding to establish a partnership to facilitate restoration of tidal wetlands in the Otay River Floodplain and an active solar salt pond site (Pond 15) within the San Diego Bay NWR.[2] The restoration project is referred to as the "Otay River Estuary Restoration Project." Poseidon proposes to fund and implement the Otay River Estuary Restoration Project to fulfill the mitigation requirements imposed by the Coastal Commission's 2007 Coastal Development Permit and the San Diego Water Board's 2009 Determination.

On May 6, 2015, the State Water Resources Control Board (State Water Board) adopted the *Amendment to the Water Quality Control Plan for Ocean Waters of California* (Ocean Plan) *Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-substantive Changes* (Desalination Amendment). The Desalination Amendment provides specific direction to regional water boards for making Water Code section 13142.5(b) determinations when permitting new or expanded seawater desalination facilities to ensure a consistent statewide approach for minimizing intake and mortality of marine life and protecting water quality and related beneficial uses of ocean waters at and near desalination facilities. The San Diego Water Board's role in making the Water Code section 13142.5(b) determination is to evaluate a range of feasible[3] alternatives for the best available site, design, technology, and mitigation measures to minimize intake and mortality of all forms of marine life and then to determine the best combination of feasible alternatives to minimize intake and mortality of all forms of marine life. (Ocean Plan chapter III.M.2.a(2).)

On September 4, 2015, Poseidon submitted a request for a Water Code section 13142.5(b) determination for permanent stand-alone operating conditions. Poseidon submitted additional information to supplement the Report of Waste Discharge (ROWD), in the form of technical memos, studies, and other reports, on multiple dates. For example, on October 22, 2018, Poseidon submitted a letter stating that it supports and proposes to implement Design Alternative 21. On November 19, 2018, Poseidon submitted a letter that describes the new

[2] Additional information regarding the Otay River Estuary Restoration Project is available on the U.S. Fish and Wildlife Service website at https://www.fws.gov/refuge/San_Diego_Bay/what_we_do/Resource_Management/Otay_Restoration/Otay_River_Estuary_Restoration_Project.html (as of June 25, 2018)

[3] The Ocean Plan provides in Appendix I that "feasible" for the purposes of Chapter III.M of the Ocean Plan means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.

intake pumps. Table H-1 lists the appendices to the ROWD. The table does not include correspondence such as the October 22, 2018 and November 19, 2018 letters[4].

Table H-1. Appendices to the ROWD

Appendix Letter	Appendix Title	Date Submitted
A	Compliance with Ocean Plan Amendments (Errata in Appendix JJ below)	September 4, 2015
B	Intake Discharge Feasibility Report (Addendum in Appendix II below)	September 4, 2015
C	Hydrodynamic Discharge Study	September 4, 2015
D	Coastal Process Effects of Reduced Intake	September 4, 2015
E	NPDES Order No. R9-2011-0028	September 4, 2015
F	Water Circulation in Agua Hedionda Lagoon	September 4, 2015
G	Acute Toxicity Study	September 4, 2015
H	Chronic Toxicity Study	September 4, 2015
I	Brine Dilution Salinity Tolerance	September 4, 2015
J	Fish-Friendly Pumping	September 4, 2015
K	Intake/Discharge Entrainment Analysis	September 4, 2015
L	CFD Modeling of Flow Augmentation System	September 4, 2015
M	Antidegradation Analysis	September 4, 2015
N	Life Cycle Cost Analysis (Revised in Appendix OO below)	September 4, 2015
O	NPDES Order No. R9-2009-0038	September 4, 2015
P	Flow, Entrainment, Impingement Minimization Plan	September 4, 2015
Q	Final EIR	September 4, 2015
R	California Coastal Commission Approval of Marine Life Mitigation Plan	September 4, 2015
S	Hydrogeologic Investigation SDG&E Encina Power Plant, Carlsbad, CA	September 4, 2015
T	Drought Proofing Through Desalting the SDG&E Approach	September 4, 2015
U	Huntington Beach Desalination Project, ISTAP Phase I & II Reports	September 4, 2015
V	U.S. Fish and Wildlife Service MOU	September 4, 2015
W	SDCWA 2010 Urban Water Management Plan and 2013 Facilities Master Plan Update	September 4, 2015
X	Construction Cost Estimates for Intake/Discharge Alternatives	September 4, 2015
Y	Implementation Schedules for Intake/Discharge Alternatives	September 4, 2015
Z	Proposed Monitoring and Reporting Plan	September 4, 2015
AA	California Coastal Commission Approval of CDP	August 18, 2016
BB	Revised Hydrodynamic Discharge Modeling Report	August 18, 2016
CC	Encina Wastewater Authority Response to Request for Information regarding the Encina Ocean Outfall as a Brine Discharge Alternative for the Carlsbad Desalination Plant	August 18, 2016
DD	Analysis of Potential for CDP Discharge to Cause Hypoxic Conditions	August 18, 2016
EE	Comparison of Fish Return Options	August 18, 2016
FF	Fish Return System Cleaning Methods	August 18, 2016
GG	Larval Fish Residence Time in Agua Hedionda Lagoon	August 18, 2016
HH	Entrapment Evaluation	August 18, 2016
II	Addendum to Intake Discharge Feasibility Report	August 18, 2016

[4]Significant correspondence with Poseidon is available at the San Diego Water Board's website: https://www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/carlsbad_desalination.html.

Appendix Letter	Appendix Title	Date Submitted
JJ	Appendix A Errata	August 18, 2016
KK	Draft Final SEIR	August 18, 2016
LL	Draft Response to Comments	August 18, 2016
MM	Draft Findings of Fact	August 18, 2016
NN	Draft Mitigation Monitoring and Reporting Program	August 18, 2016
OO	Revised Life Cycle Cost Analysis	August 18, 2016
PP	Intake/Discharge Design Modifications	August 18, 2016
QQ	Response to Questions Regarding CDP Discharge Modeling Reports (Revised February 21, 2017)	February 21, 2017
RR	Feasibility Assessment of Alternative Brine Discharge to the Encina Ocean Outfall	October 31, 2016
SS	Feasibility Assessment of Wedge-wire Screen (WWS) Intake in Agua Hedionda Lagoon	October 31, 2016
TT	Fish Return System Discharge Location Alternatives Analysis	October 31, 2016
UU	Brine Mixing Zone Habitat Assessment (Revised January 18, 2017)	January 18, 2017
VV	Establishing the Location of the Zone of Initial Dilution for Stand-Alone Operation (Revised March 14, 2017)	March 14, 2017
WW	Brine Discharge Mortality Calculations	January 30, 2017
XX	Current and 2065 Area BMZ and Wetlands Restoration Project	January 30, 2017
YY	Marine Life Mortality Comparison between the Proposed Screening Location and the Lagoon Screen Locations	January 30, 2017
ZZ	Marine Life Mortality Report and Mitigation Calculation (Rev. 1)	April 11, 2017
AAA	Fish Return Antidegradation	April 11, 2017
BBB	Evaluation of Intake Alternatives 1, 15-20	April 11, 2017
CCC	Evaluation of Intake Alternatives 1, 11-14	April 11, 2017
DDD	Feasibility Assessment of Carlsbad Desalination Plant Intake and Discharge	November 20, 2017
EEE	Revised Feasibility Assessment for Intake Alternatives 1, 15, and 21	April 4, 2018
FFF	Revised APF Calculations	May 31, 2018
GGG	Revised Entrainment Analysis for Brine Discharge Options	December 14, 2018
HHH	Relative Salinity Impacts in the Brine Mixing Zone (BMZ) of the Carlsbad Desalination Plant (CDP) for Variable Discharge Rates	December 18, 2018

The ROWD, including all appendices and the request for a Water Code section 13142.5(b) determination for permanent stand-alone operating conditions and information submitted in support of this request, can be found on the San Diego Water Board website at: https://www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/carlsbad_desalination.html. All documents, data, correspondence and other materials that are identified in this Attachment H.1 are incorporated herein by this reference and made part of the record hereto.

Chapter III.M.1(a)(1) of the Ocean Plan authorizes the San Diego Water Board to require Poseidon, as owner and operator of the CDP, to hire a neutral third-party entity to review studies and models and make recommendations to the San Diego Water Board for consideration in developing the Water Code section 13142.5 determination. Following discussions with Poseidon, a Science Advisory Panel (SAP), previously convened by the Coastal Commission, was selected to conduct the neutral third-party review of studies and models and make recommendations to the San Diego Water Board. The SAP first convened on June 21, 2018 and submitted a final report on September 15, 2018. The SAP reviewed topics regarding the biological performance standard for mitigation; mitigating for mortality to all forms

of marine life; and comparing the intake and mortality of all forms of marine life associated with various alternative intake screen locations.[5] The SAP recommendations in summary are:

1) The San Diego Water Board's biological performance standard of fish productivity (i.e the production of new fish biomass) of 1,715.5 kg/year for the mitigation project may be removed because the monitoring required to assess the biological performance standard would likely be counter-productive to the goal for the mitigation. By contrast, evaluating mitigation performance through comparison with appropriate reference sites is much less intrusive in comparison;

2) Poseidon's restoration mitigation project (Otay River Estuary Restoration Project (ORERP)), if successful, should adequately compensate for the projected mortality of all forms of marine life with respect to the intake related impacts under stand-alone operation; and

3) Poseidon's evaluation of intake and mortality of marine life in the design alternatives was adequate in consideration of current data constraints. Further monitoring of the new intake system for permanent stand-alone operation is recommended[6].

The SAP's final report with recommendations is available on the San Diego Water Board website at: https://www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/docs/SAP/Poseidon_Carlsbad_SAP_report.pdf (as of November 14, 2018)

The San Diego Water Board conducted a Water Code section 13142.5(b) analysis of permanent stand-alone operations at the Facility in accordance with Ocean Plan chapter III.M. In conducting the analysis, the San Diego Water Board independently reviewed the record for development of this Order, including the ROWD and all supplemental documents, and the SAP recommendations. The San Diego Water Board evaluated a range of feasible alternatives for the best available site, design, technology, and mitigation measures to minimize intake and mortality of all forms of marine life and determined the best combination of feasible alternatives to minimize intake and mortality of all forms of marine life. The San Diego Water Board has determined that Design Alternative 21 provides the best available site, design, technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life while taking into account construction, operation, and maintenance costs.[7]

[5] The San Diego Water Board topics for SAP review is available on the Board's website at https://www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/docs/SAP/2018-01-24_Final_Topics_for_3rd_party.pdf (as of November 14, 2018)

[6] Section VI.C.2.ba. of the Order requires a Brine Discharge Technology Empirical Study that will assess the impacts from the new intake system withdrawing seawater to provide flow augmentation dilution of the brine discharge.

[7] The Water Code section 13142.5(b) Determination is conditional on completion of the Multiport Diffuser Analysis described in Section VI.C.2.a of this Order requiring the collection of additional data to confirm the conclusion that flow augmentation and a multiport diffuser have a comparable level of intake and mortality of all forms of marine life. See section VI.C.2.a of this Order and Finding 31, below, for discussion of the conditional determination.

Table H-2 below and Attachment H.2 of this Order set forth the San Diego Water Board's considerations of the feasible alternatives evaluated and describes the San Diego Water Board's conclusion that Design Alternative 21 represents the best combination of feasible alternatives to minimize intake and mortality of all forms of marine life.

Table H-2: Water Code Section 13142.5(b) Determination

Finding No.	Ocean Plan, chapter III.M Reference	Ocean Plan Requirement	Finding
-	2.a	Water Code section 13142.5(b) Determinations for New and Expanded Facilities: Site, Design, Technology, and Mitigation Measures Feasibility Considerations. General Considerations:	
1	2.a(1)	The owner or operator shall submit a request for a Water Code section 13142.5(b) determination to the appropriate regional water board as early as practicable. This request shall include sufficient information for the regional water board to conduct the analyses described below. The regional water board in consultation with the State Water Board staff may require an owner or operator to provide additional studies or information if needed, including any information necessary to identify and assess other potential sources of mortality to all forms of marine life. All studies and models are subject to the approval of the regional water board in consultation with State Water Board staff. The regional water board may require an owner or operator to hire a neutral third-party entity to review studies and models and make recommendations to the regional water board.	On September 4, 2015, Poseidon as the owner and operator of the Facility submitted with the ROWD, a request for a Water Code section 13142.5(b) determination for permanent stand-alone operating conditions. The San Diego Water Board in consultation with the State Water Board reviewed the request and all supporting appendices. During that review, additional information was provided by Poseidon including revised dilution studies and further investigation of various intake configuration alternatives. The ROWD and appendices are available on the San Diego Water Board's website at: https://www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/carlsbad_desalination_appendices.html (as of June 25, 2018) The San Diego Water Board required Poseidon to hire a neutral third party to review studies and models and make recommendations to the San Diego Water Board for the reissuance of Poseidon's NPDES permit for permanent stand-alone operations of the Facility. Following discussions with Poseidon, a previously established SAP overseen by the Coastal Commission was chosen to review three topics pertaining to the permit reissuance: 1) Removing the biological performance standard for mitigation; 2) Mitigating for mortality to all forms of marine life; and

Finding No.	Ocean Plan, chapter III.M Reference	Ocean Plan Requirement	Finding
			3) Comparing intake and mortality of all forms of marine life associated with different intake screen locations. The SAP recommendations in summary are: 1) The San Diego Water Board's biological performance standard of fish productivity (i.e the production of new fish biomass) of 1,715.5 kg/year for the mitigation project may be removed because the monitoring required to assess the biological performance standard would likely be counter-productive to the goal for the mitigation. By contrast, evaluating mitigation performance through comparison with appropriate reference sites is much less intrusive; 2) Poseidon's restoration mitigation project should be adequate compensation with respect to intake related impacts under stand-alone operation if it is successful; and 3) Poseidon's evaluation of intake and mortality of marine life in the design alternatives was adequate in consideration of current data constraints. Further monitoring of the new intake system for permanent stand-alone operation is recommended. The SAP's full report with recommendations was available starting June 25, 2018 the San Diego Water Board's website: https://www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/docs/SAP/Poseidon_Carlsbad_SAP_report.pdf

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2	2.a(2)	The regional water board shall conduct a Water Code section 13142.5(b) analysis of all new and expanded desalination facilities. A Water Code section 13142.5(b) analysis may include future expansions at the facility. The regional water board shall first analyze separately as independent considerations a range of feasible alternatives for the best available site, the best available design, the best available technology, and the best available mitigation measures to minimize intake and mortality of all forms of marine life. Then, the regional water board shall consider all four factors collectively and determine the best combination of feasible alternatives to minimize intake and mortality of all forms of marine life. The best combination of alternatives may not always include the best alternative under each individual factor because some alternatives may be mutually exclusive, redundant, or not feasible in combination.	The San Diego Water Board conducted a Water Code section 13142.5(b) analysis of the Facility. In doing so, the San Diego Water Board analyzed separately as independent considerations a range of feasible alternatives for the best available site, best available design, the best available technology, and the best available mitigation measures to minimize intake and mortality of all forms of marine life. The San Diego Water Board also analyzed and considered all four factors collectively to determine the best combination of feasible alternatives to minimize intake and mortality of all forms of marine life. This table and Attachment H.2 summarize the San Diego Water Board's analysis and findings for the separate and combined considerations of various feasible alternatives for the Water Code section 13142.5(b) determination.
3	2.a(3)	The regional water board's Water Code section 13142.5(b) analysis for expanded facilities may be limited to those expansions or other changes that result in the increased intake or mortality of all forms of marine life, unless the regional water board determines that additional measures that minimize intake and mortality of all forms of marine life are feasible for the existing portions of the facility.	The San Diego Water Board's Water Code section 13142.5(b) analysis was not limited to the Facility expansions or other changes that result in increased intake or mortality of all forms of marine life. The 2009 Determination was limited in scope to co-located and temporary stand-alone operations of the Facility with the EPS. Finding 52 of the 2009 Determination states: "Implementation of the March 27, 2009 Minimization Plan will ensure that the CDP is in compliance with Water Code section 13142.5(b) under co-location operations to benefit the CDP." The new Water Code section 13142.5(b) determination for this Order is for permanent stand-alone operations of the

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			Facility upon termination of power-generating activities at EPS. As such, the Facility requires a Water Code section 13142.5(b) determination for permanent stand-alone operation and not just for those expansions or other changes that result in increased intake or mortality of all forms of marine life.
4	2.a(4)	In conducting the Water Code section 13142.5(b) determination, the regional water boards shall consult with other state agencies involved in the permitting of that facility, including, but not limited to: California Coastal Commission, California State Lands Commission, and California Department of Fish and Wildlife. The regional water board shall consider project-specific decisions made by other state agencies; however, the regional water board is not limited to project-specific requirements set forth by other agencies and may include additional requirements in a Water Code section 13142.5(b) determination.	In conducting the Water Code section 13142.5(b) determination, the San Diego Water Board consulted with, the Coastal Commission, the California State Lands Commission, and the California Department of Fish and Wildlife.
5	2.a(5)	A regional water board may expressly condition a Water Code section 13142.5(b) determination based on the expectation of the occurrence of a future event. Such future events may include, but are not limited to, the permanent shutdown of a co-located power plant with intake structures shared with the desalination facility, or a reduction in the volume of wastewater available for the dilution of brine. The regional water board must make a new Water Code section 13142.5(b) determination if the foreseeable future event occurs.	The 2009 Determination was conditioned on the expectation of the permanent termination of the co-located operations. Finding 4 of the 2009 Determination states “If EPS permanently ceases operations and the Discharger proposes to independently operate the existing EPS seawater intake and outfall for the benefit of the CDP ("standalone operation"), it will be necessary to evaluate whether, under those conditions, the CDP complies with the requirements of Water Code section 13142.5(b). Additional review will be necessary in part because under stand-alone operations, the Discharger will have more flexibility in how it operates the intake structure and outfall and additional and/or better design and technology features may be feasible. The Discharger will be required

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			to submit a new Report of Waste Discharge to the Regional Board for authorization to operate in stand-alone mode, and shall seek review under Water Code section 13142.5(b) for such stand-alone operation, with permanent shut down of the EPS facility, within 90 days after EPS provides written notice to the California Independent System Operator of its intent to shutdown permanently all of its generating units." The San Diego Water Board has conducted this new Water Code section 13142.5(b) ~~d~~Determination as required in conformance with Finding 9 of the 2009 Determination and the information on which the finding was based and as required by the Ocean Plan to evaluate the best site, design, technology, and mitigation measures feasible to minimize the intake and mortality of marine life during permanent stand-alone operations of the Facility. The Water Code section 13142.5(b) determination in this Order is conditional on the expectation that the Multiport Diffuser Analysis (see Order, section VI.C.2.a) will confirm the San Diego Water Board's conclusion that flow augmentation and a theoretical multiport diffuser provide a comparable level of intake and mortality of all forms of marine life. If the San Diego Water Board's conclusion is confirmed, then the condition will have no further effect. If, instead, the study fails to confirm the conclusion that the two discharge technologies have a comparable level of intake and mortality of all forms of marine life, a new Water Code section 13142.5(b) determination will be required. (See Ocean Plan, chapter III.M.2.a(5).)
6	2.a(5)(a)	The owner or operator shall provide notice to the regional water board as soon as it becomes aware that the expected future event will occur~~,~~ and shall submit a new	The EPS ~~is~~ permanently ceased power generating operations as of December 11, 2018 and Poseidon

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		request for a Water Code section 13142.5(b) determination to the regional water board at least one year prior to the event occurring. If the owner or operator does not become aware that the event will occur at least one year prior to the event occurring, the owner or operator shall submit the request as soon as possible.	requested a new Water Code section 13142.5(b) determination on September 4, 2015.
7	2.(a)(5)(b)	The regional water board may allow up to five years from the date of the event for the owner or operator to make modifications to the facility required by a new Water Code section 13142.5(b) determination, provided that the regional water board finds that 1) any water supply interruption resulting from the facility modifications requires additional time for water users to obtain a temporary replacement supply, or 2) such a compliance period is otherwise in the public interest and reasonably required for modification of the facility to comply with the determination.	In accordance with chapter III.M.2.(a)(5)(b) of the Ocean Plan, the Order includes a compliance schedule at section VI.C.9 which provides Poseidon up to five years from the date EPS permanently ceased power generating operations to secure permits, complete design, and construct a new intake structure that supports stand-alone operation of the Facility while maintaining compliance with the Ocean Plan. This compliance period to modify the intake technology as required by this Water Code section 13142.5(b) determination is in the public interest to maintain Facility operations and continue drinking water production at the Facility during that time when the EPS has permanently ceased power generating operations prior to the construction of a new intake structure, according to the schedule provided by Poseidon on September 13, 2018. The approximately 4.5 ~~five~~-year compliance schedule reflects a realistic assessment of the time needed to design, obtain necessary permits for, construct and put into operation a new intake structure within the waters of Agua Hedionda Lagoon. If a new Water Code section 13142.5(b) determination for this Facility is required, Ocean Plan chapter III.M.2.a.(5)(b) authorizes the Board to allow up to five years from the date of the event for modifications to the facility to be made to comply with the determination provided certain findings are made.

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8	2.(a)(5)(c)	If the regional water board makes a Water Code section 13142.5(b) determination for a desalination facility that will be co-located with a power plant, the regional water board shall condition its determination on the power plant remaining in compliance with the Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling.	This Water Code section 13142.5(b) ~~d~~Determination is for permanent stand-alone operations of the Facility. Because EPS has ceased power generation operations and CDP is no longer co-located with EPS, the provision requiring power plant compliance with the *Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling* (Once-Through Cooling Policy) does not apply.
-	2.b	**Site Location:** The Site is the general onshore and offshore location of a new or expanded facility. There may be multiple potential facility design configurations within any given site. For each potential site, in order to determine whether a proposed facility site is the best available site feasible to minimize intake and mortality of all forms of marine life, the regional water board shall require the owner or operator to:	
9	2.b(1)	Consider whether subsurface intakes are feasible.	The San Diego Water Board previously considered the feasibility of various intake configurations (beach wells, slant wells, horizontal wells, offshore subsurface infiltration galleries, and the existing EPS intake) in the 2009 Determination for the CDP, including the applicability of subsurface intake technology, and found that subsurface intakes were not feasible at that time. In support of the 2009 Determination the San Diego Water Board concluded that Poseidon analyzed the following intake alternatives: (1) Subsurface intake (vertical and horizontal beach wells, slant wells, and infiltration galleries); (2) new open ocean intake; (3) Modifications to the existing power plant intake system; and (4) Installation of variable frequency drives (VFDs) on seawater intake pumps." (see Finding 9 of the 2009 Determination). The San Diego Water Board also concluded that the proposed technology [surface water intakes with flow augmentation discharge] for the CDP is the best available technology feasible under co-location operation for the CDP benefit (see Findings 35-39 of the 2009 Determination)

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			Following Poseidon's September 4, 2015 request for a new Water Code section 13142.5(b) determination for stand-alone operation of the Facility, the San Diego Water Board independently re-evaluated the feasibility of subsurface intakes for the Water Code section 13142.5(b) determination under this Order. Poseidon conducted a hydrogeological study of the subsurface conditions in the vicinity of the CDP, which concluded that subsurface intakes were not feasible because of limited water production capacity of the subsurface geological formation, poor water quality (high salinity and turbidity) of collected source water, cost, and environmental considerations (i.e., construction impacts, operational impacts, and aesthetics). The San Diego Water Board has considered the findings of the 2009 Determination for the Water Code section 13142.5(b) determination under this Order and the information on which the findings were based and concluded that oceanographic geologic, hydrogeologic, and seafloor conditions have not changed since the 2009 Determination such that subsurface intakes would now be feasible. The cost for relocating the CDP to an alternate site where sub-surface intakes are technically feasible would be economically infeasible. The City of Carlsbad's Final Environmental Impact Report (EIR)[1] and the Coastal Commission's Coastal Development Permit[2] also concluded that beach wells, slant wells, horizontal wells, and offshore seafloor infiltration galleries were not feasible. See Appendices Q and AA to the ROWD. Poseidon also explored the feasibility of two additional subsurface intake alternatives for the Facility: (1) a seafloor infiltration gallery (SIG) located in Agua Hedionda Lagoon coupled with an ocean outfall diffuser and (2) a

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			lagoon-based SIG coupled with flow augmentation using the existing EPS intake and an ocean outfall. Poseidon has estimated a total project cost of $679 million and a total annual cost, including operating costs, of $94 million to implement a SIG with a multiport diffuser. Poseidon has estimated a total project cost of $1,038 million and a total annual cost, including operating costs, of $159 million to implement a SIG with flow augmentation. See Appendices B, O, and II to the ROWD. Based on the findings in the 2009 Determination and the information provided by Poseidon in the ROWD, the San Diego Water Board has concluded that subsurface intakes are not feasible at this time. The conclusion that subsurface intakes are not feasible is consistent with the findings of the SDCWA's Final Supplemental EIR (SEIR), dated August 2016 contained in Appendix KK to the ROWD. and the Coastal Commission's Coastal Commission's Coastal Development Permit[2]. [1] See *Precise Development Plan and Desalination Plant Project, Final Environmental Impact Report (EIR 03-05)*, *City of Carlsbad, California, SCH# 200404108*, *FEIR Certified* June 13, 2006 The FEIR is available at this website: http://www.carlsbaddesal.com/eir.html (as of June 25, 2018). [2] The Coastal Commission's Coastal Development Permit is available at this website: https://www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/docs/appendices/Appendix_AA.pdf (as of June 25, 2018).
10	2.b(2)	Consider whether the identified need for desalinated water is consistent with an applicable adopted urban water	A fundamental objective of the Facility is its contribution of desalinated seawater as a component of meeting regional

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		management plan prepared in accordance with Water Code section 10631, or if no urban water management plan is available, other water planning documents such as a county general plan or integrated regional water management plan.	water supply planning goals. The SDCWA's *2015 Urban Water Management Plan* (UWMP)[1] contains a water supply reliability assessment which states that development of a diversified mix of water resources including surface water, groundwater, recycled water, potable reuse and desalinated seawater, is needed over the next 25 years to meet the region's existing and future water demands. The UWMP identifies the Facility as providing a long-term, reliable, drought-resistant water supply for the San Diego Region. The UWMP describes the additional annual average potable water output potentially resulting from the proposed CDP modifications as an adaptive management supply that could be used to meet projected regional growth and water demands. Accordingly, the identified need for desalinated water is consistent with an applicable adopted urban water management plan. [1] SDCWA's 2015 UWMP is available at this website: https://www.sdcwa.org/urban-water-management-plan (as of June 25, 2018)
11	2.b(3)	Analyze the feasibility of placing intake, discharge, and other facility infrastructure in a location that avoids impacts to sensitive habitats and sensitive species.	Poseidon analyzed the feasibility of locating the Facility intake, discharge, and other facility infrastructure in a location that avoids impacts to sensitive habitats and sensitive species. See Appendix A to the ROWD. Of the 21 design alternatives proposed, Poseidon initially identified Design Alternatives 1 and 15 as "preferred alternatives." Both of Poseidon's previously preferred design alternatives make use of the existing EPS intake bar racks and tunnels with new intake pumps and new 1-mm screens located on-shore and within the intake structure, rather than screens located in or at the interface of the Agua Hedionda Lagoon. Recommendation, Condition, and Finding (RCF) number 21 in Appendix A to

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			the ROWD explains Poseidon's reasoning regarding their preferred location for the on-shore intake screens using the existing EPS intake structure. Appendix A also states that the continued use of the EPS intake would a) avoid impacts because no significant construction would be required in the lagoon and b) avoid impacts to pelagic fishes commonly reported in the nearshore water-column habitat. Following extensive meetings with the San Diego Water Board and the State Water Board, Poseidon stated in a letter dated October 22, 2018 that the SDCWA and Poseidon have concluded that Design Alternative 21 which would locate 1-mm wedgewire screens within Agua Hedionda Lagoon is best suited to comply with the requirements of the Ocean Plan and propose to implement Design Alternative 21. Agua Hedionda Lagoon is habitat for the marine species garibaldi, *Hypsypops rubicundus*. Although garibaldi is not an endangered species, there is concern that commercial collection by the saltwater aquarium industry has reduced its numbers. In 1995, the California Legislature acted to protect the garibaldi by placing a moratorium on commercial collection and designating garibaldi as the official State Marine Fish of California, under CDFW fishery regulations. Agua Hedionda Lagoon's artificial rocky shoreline provides spawning grounds for garibaldi. Few adult garibaldi were surveyed in the 2008 Cabrillo Power I LLC EPS Clean Water Act Section 316(b) impingement mortality and entrainment characterization study (2008 EPS Study)[1]. The 2008 EPS Study counted only 5 garibaldi individuals impinged during the year of sampling. However, the probability of mortality by entrainment for the garibaldi larval population in the lagoon

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			was found to be 14.2 percent with an estimated annual 29,287,646 larval fish entrained per year. The 2008 EPS study states: *"quantitative observations of garibaldi in the Outer Lagoon … during August 2005 recorded densities of 7 fish per 30 m x 2 m transect along the North Jetty, 2 fish per transect in front of the EPS intake, and 1 per transect along the east channel leading into the Middle Lagoon. Based on the distribution of hard substrate in the lagoon, it would not be an overestimate to conclude that several hundred garibaldi could be present in [Agua Hedionda Lagoon], especially during the peak of breeding season in June and July."* The San Diego Water Board has determined that wedge-wire screens (WWS) must be used to minimize impingement and avoid entrapment of garibaldi and other fish. As explained in the *Final Staff Report Including the Final Substitute Environmental Documentation for the Final Desalination Amendment*[2] (Desalination Amendment Staff Report), wedge-wire technology reduces impingement, entrainment, and entrapment of aquatic life by: • Acting as a physical barrier to prevent aquatic organisms sufficiently larger than the screen slot size (1 mm) from being entrained; • Using sweeping currents in the source water to move aquatic organisms past the screen faces; and • Utilizing a fine-mesh cylindrical wedgewire for the screens can further reduce entrainment of juvenile and adult stage of aquatic organisms. Additionally, to minimize entrainment of larvae, the intake screens should be located at point of water withdrawal in

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			the lagoon and the flow-through velocity of the screens should be minimized. The San Diego Water Board has concluded that Design Alternative 21 is the best alternative to avoid impacts to sensitive habitats and species. Design Alternative 21 is located within Agua Hedionda Lagoon's outer pond. This design avoids the rocky shoreline habitat by locating the screens on the sandy seafloor in the interior of the lagoon. The intake laterals may be covered with natural sediments to restore habitat impacts. Design Alternative 21 also employs WWS while maintaining the Ocean Plan's 0.5 ft/sec or less through-screen velocity standard, minimizing entrainment and impingent; and avoiding entrapment of marine life. Further analysis of the intake and discharge alternatives is provided in Attachment H.2 of this Order to comparatively demonstrate that Design Alternative 21 is the best alternative to minimize intake and mortality of all forms of marine life ~~mortality~~. Design Alternative 21 is described in Appendices DDD and EEE to the ROWD. The San Diego Water Board has also concluded that the Facility's current discharge location and proposed brine mixing zone (BMZ) avoid impacts to sensitive habitats and species by using an existing discharge structure. Additional information regarding the proposed design alternatives and the impacts associated with impingement and entrainment from the intake of seawater is contained in Appendices B, J, K, P, X, Y, EE, FF, GG, HH, II, PP, SS, TT, YY, ZZ, AAA, BBB, CCC, DDD, and EEE to the ROWD. Additional information regarding the proposed discharge structure is contained in Appendices C, G, H, I, K, X, Y,

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			BB, CC, DD, PP, QQ, RR, TT, UU, VV, WW, XX, and ZZ to the ROWD. [1]The 2008 EPS Study is available at this website: https://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/powerplants/encina/docs/eps_ip2011att1_imec.pdf (as of June 25, 2018). [2]The Desalination Amendment Staff Report is available on the State Water Board website at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/rs2015_0033_sr_apx.pdf (as of June 25, 2018).
12	2.b(4)	Analyze the direct and indirect effects on all forms of marine life resulting from facility construction and operation, individually and in combination with potential anthropogenic effects on all forms of marine life resulting from other past, present, and reasonably foreseeable future activities within the area affected by the facility.	Poseidon analyzed and summarized the direct and indirect effects on all forms of marine life resulting from the proposed alternatives for the Facility. See Appendices A, YY, ZZ, BBB, CCC to the ROWD. Based on the information provided by Poseidon, the San Diego Water Board has also concluded that the intake structure alternative in Design Alternative 21 will most effectively minimize or avoid direct and indirect effects on all forms of marine life resulting from facility construction and operation, individually and in combination with potential anthropogenic effects on all forms of marine life resulting from other past, present, and reasonably foreseeable future activities within the area affected by the Facility. Further analysis and comparison of the intake and discharge alternatives in support of this conclusion is provided in Attachment H.2 of this Order. Although the construction of Design Alternative 21 may have greater temporary impacts to the benthic habitat within Agua Hedionda Lagoon when compared to some of

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			the other proposed intake alternatives, the permanent impact of approximately 0.2 acres of benthic habitat is less than or similar to the permanent benthic impacts of other alternatives considered and also avoids long-term, continuous impacts to marine life caused by the other intake alternatives that rely on an onshore intake structure. Temporary impacts from the intake laterals can be addressed by restoring natural sediment after construction. Other intake alternatives, such as Design Alternatives 1 and 15, may cause entrapment and impacts associated with a fish return system because they rely on an intake structure located at the shoreline of Agua Hedionda Lagoon. Other intake alternatives at the shoreline, such as Design Alternatives 11 through 14, could potentially remove the rocky shoreline suitable for garibaldi habitat. Additionally, the benthic habitat quality in Agua Hedionda Lagoon is periodically subject to disturbance caused by maintenance dredging conducted within the lagoon to maintain the intake channel for the EPS. Design Alternative 21 may not require the same extent of lagoon dredging as the other intake alternatives. Further analysis and comparison of the intake and discharge alternatives is provided in Attachment H.2 of this Order.
13	2.b(5)	Analyze oceanographic geologic, hydrogeologic, and seafloor topographic conditions at the site, so that the siting of a facility, including the intakes and discharges, minimizes the intake and mortality of all forms of marine life.	The San Diego Water Board considered the feasibility of various intake configurations (beach wells, slant wells, horizontal wells, offshore subsurface infiltration galleries, and the existing EPS intake) in the 2009 Determination for the CDP, including the applicability of subsurface intake technology, and found that subsurface intakes were not feasible at that time due to limited production capacity of the subsurface geological formation, poor water quality of

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			collected source water, excessive cost, and environmental considerations. In the 2009 Determination, the San Diego Water Board considered several alternative seawater intake, discharge, screening, and treatment technologies prior to selecting the desalination plant intake, screening, and seawater treatment technologies planned for the CDP. When economic, environmental and technological factors are considered, the improved power plant intake screening alternatives were not capable of being accomplished in a successful manner within a reasonable period of time. (see Finding 34 of the 2009 Determination) The San Diego Water Board also concluded in support of the 2009 Determination that Poseidon analyzed the following intake alternatives: (1) Subsurface intake (vertical and horizontal beach wells, slant wells, and infiltration galleries); (2) new open ocean intake; (3) Modifications to the existing power plant intake system; and (4) Installation of variable frequency drives (VFDs) on seawater intake pumps. (see Finding 35 of the 2009 Determination) The San Diego Water Board has considered and reevaluated the findings of the 2009 Determination for the Water Code section 13142.5(b) ~~d~~Determination under this Order and the information on which the findings were based and concluded that oceanographic geologic, hydrogeologic, and seafloor conditions have not changed since the 2009 Determination such that subsurface intakes would now be feasible. Further analysis of the intake and discharge alternatives is provided in Attachment H.2. See Findings 9, 11, and 12 above, and Appendices O, P, Q, R and AA to the ROWD.

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			Poseidon analyzed the oceanographic, geological and hydrogeological conditions in Agua Hedionda Lagoon in Appendices B, D, F, S, T, DD, II, PP, SS, YY, and ZZ to the ROWD. Poseidon analyzed the potential nearshore and offshore discharge effects in Appendices B, C, G, H, I, K, L, S, BB, PP, UU, VV, WW, and XX to the ROWD.
14	2.b(6)	Analyze the presence of existing discharge infrastructure, and the availability of wastewater to dilute the facility's brine discharge.	EPS discontinued power generating activities on December 11, 2018. The closest existing discharge infrastructure and source of treated wastewater for dilution is the Encina Ocean Outfall which is owned and operated by the Encina Wastewater Authority. The Encina Ocean Outfall (EOO) is located approximately two miles south of the CDP. According to the Encina Wastewater Authority, the EOO is near full capacity during large storm events, and future wastewater recycling will significantly reduce the availability of wastewater for diluting the brine discharge. Poseidon submitted studies regarding the potential use of EOO as a brine discharge alternative for the CDP as Appendices B and CC to the ROWD. These studies found that the use of wastewater was infeasible due to limited flow for dilution and limited capacity at any nearby existing wastewater outfalls. For these reasons, the San Diego Water Board has determined that discharging brine by commingling with wastewater from the EOO is infeasible at this time. Additional information regarding the feasibility of discharging brine to the EOO is provided in Appendix RR to the ROWD.

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15	2.b(7)	Ensure that the intake and discharge structures are not located within a Marine Protected Area (MPA) or State Water Quality Protection Areas (SWQPA) with the exception of intake structures that do not have marine life mortality associated with the construction, operation, and maintenance of the intake structures (e.g. slant wells). Discharges shall be sited at a sufficient distance from a MPA or SWQPA so that the salinity within the boundaries of a MPA or SWQPA does not exceed natural background salinity. To the extent feasible, surface intakes shall be sited so as to maximize the distance from a MPA or SWQPA.	The nearest MPA or SWQPA is Batiquitos Lagoon, approximately five miles south of the Facility. Batiquitos Lagoon is a MPA, specifically a State Marine Conservation Area, with a no-take regulation by the CDFW[1]. As noted in Appendix C, BB, and QQ to the ROWD, the intake and discharge is sited at a sufficient distance from a MPA or SWQPA so that the salinity within the boundaries of a MPA or SWQPA does not exceed natural background salinity. In addition, based upon the models and studies that Poseidon submitted, the San Diego Water Board finds that CDP's brine discharge will not exceed 2.0 ppt above natural background salinity outside the BMZ, the edge of which is at least five miles from Batiquitos Lagoon. (See Finding 18 of this Attachment H.1 and further analysis of the discharge alternatives in Attachment H.2 of this Order.) Accordingly, the San Diego Water Board finds that the discharge is sited at a sufficient distance from a MPA or SWQPA so that the salinity within the boundaries of ta MPA or SWQPA does not exceed natural background salinity. [1]More information regarding Batiquitos Lagoon designation as a MPA is provided at this website: https://www.wildlife.ca.gov/conservation/marine/mpas/network/southern-california#27149500-batiquitos-lagoon-state-marine-conservation-area (as of June 25, 2018)
-	2.c	Design: Design is the size, layout, form, and function of a facility, including the intake capacity and the configuration and type of infrastructure, including intake and outfall structures. The regional water board shall require that the owner or operator perform the following in determining whether a proposed facility design is the best available design feasible to minimize intake and mortality of all forms of marine life:	

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16	2.c(1)	For each potential site, analyze the potential design configurations of the intake, discharge, and other facility infrastructure to avoid impacts to sensitive habitats and sensitive species.	See Findings 9, 11, 12, 13, and 15 regarding the evaluation of the potential design configurations of intake and discharge structures. Further analysis of the intake and discharge alternatives is provided in Attachment H.2 of this Order.
17	2.c(2)	If the regional water board determines that subsurface intakes are not feasible and surface water intakes are proposed instead, analyze potential designs for those intakes in order to minimize the intake and mortality of all forms of marine life.	See Finding 9 regarding the San Diego Water Board's 2009 Determination that subsurface intakes are not feasible. Based on the findings in the 2009 Determination and the information provided by Poseidon in the ROWD, the San Diego Water Board has concluded that subsurface intake alternatives are not feasible at this time. This conclusion is consistent with the findings of the SDCWA's Final Supplemental EIR dated August 2016 contained in Appendix KK to the ROWD and consistent with the Coastal Commission's Coastal Development Permit in Appendix Q to the ROWD Poseidon's surface water intake alternatives analysis is provided in the Appendices B, Q, AA, II, KK, PP, SS, YY, BBB, CCC, DDD, and EEE to the ROWD. Further analysis of the intake and discharge alternatives is provided in Attachment H.2 of this Order.
18	2.c(3)	Design the outfall so that the BMZ does not encompass or otherwise adversely affect existing sensitive habitat.	See Findings 12, 13, 15, and 19 regarding the design of the outfall. Further analysis of the intake and discharge alternatives is provided in Attachment H.2 of this Order. Based on the referenced findings and the information provided in the ROWD, the San Diego Water Board finds that the outfall has been designed so that the BMZ does not encompass or otherwise adversely affect sensitive habitat. No kelp beds or permanently exposed natural rock outcrops exist within the BMZ.
19	2.c(4)	Design the outfall so that discharges do not result in dense, negatively buoyant plumes that result in adverse	Based on information provided by Poseidon, the San Diego Water Board analyzed two outfall design

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		effects due to elevated salinity or hypoxic conditions occurring outside the BMZ. An owner or operator must demonstrate that the outfall meets this requirement through plume modeling and/or field studies. Modeling and field studies shall be approved by the regional water board in consultation with State Water Board staff.	alternatives following consideration of the availability of wastewater for dilution: 1) a multiport diffuser alternative and 2) a flow augmentation alternative. The information provided by Poseidon regarding the outfall design analysis is provided in Appendices B, C, K, L, N, X, Y, BB, CC, DD, II, OO, PP, QQ, RR, UU, and WW to the ROWD. The multiport diffuser alternative that the San Diego Water Board analyzed as modeled by Poseidon consisted of a 72-inch outfall pipe extending approximately 4,000 feet (ft.) offshore, which would convey the brine discharge from the Facility to a multiport diffuser system where four duckbill diffuser ports would eject the brine into the water column at a high velocity to promote rapid diffusion and dispersion. The diffusers were designed to promote rapid mixing to prevent the formation of negatively buoyant plumes. Under this scenario, the BMZ would be a circle with a radius of 100 meters (328 ft.), originating from each of the diffuser ports. The duckbill diffusers were spaced approximately 100 ft. apart. Outside of the BMZ, salinity would not exceed 2 parts per thousand (ppt) over ambient background salinity. Within the BMZ, entrained organisms would experience elevated salinity. The benthic area encompassed by the BMZ would be approximately 12.3 acres. The flow augmentation alternative modeled by Poseidon and analyzed by the San Diego Water Board consisted of commingling the brine discharge from the Facility in the existing EPS discharge channel with flow augmentation water from the Agua Hedionda Lagoon to initially dilute the brine to 42 ppt. Final dilution to comply with the receiving water limitation for salinity was accomplished through natural mixing in the surf zone. Under these conditions the BMZ would comprise an area slightly larger than a

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			semicircle with a radius of 200 meters (656 ft.), originating from the end of the discharge jetty and continuing out to the ocean and circling back to the shoreline. The benthic area encompassed by the BMZ would be approximately 18.51 acres. Poseidon concluded in Appendix DD to the ROWD that "hypoxic conditions are not present under existing operating conditions, and are not expected to be present outside the 200 meter (656 ft.) BMZ under the proposed operating conditions." In support of this application, Poseidon also submitted an entrainment study, based on Tenera Environmental's 2008 Encina Power Station Clean Water Act Section 316(b) Impingement Mortality and Entrainment Characterization Study, as Appendix K of the 2015 ROWD. Poseidon subsequently revised the entrainment effects calculations as recommended by the SAP and provided the results as Appendices FFF and GGG to the ROWD, which the San Diego Water Board has reviewed and analyzed. Poseidon's entrainment effects study found that for this Facility, flow augmentation with a surface water intake would not result in adverse effects due to elevated salinity or hypoxic conditions occurring outside the BMZ. Poseidon also found that the use of wastewater was infeasible due to limited flow for dilution and limited capacity at any nearby existing wastewater outfalls In addition, Order No. R9-2006-0065 required extensive surf zone monitoring for dissolved oxygen. The results of this monitoring showed that the dissolved oxygen levels in ocean waters within the zone of initial dilution have met the Ocean Plan's dissolved oxygen water quality standards. The discharge of brine using flow augmentation dilution technology has not resulted in hypoxic conditions.

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			Accordingly, the San Diego Water Board finds that the outfall has been designed so that discharges do not result in dense, negatively buoyant plumes that result in adverse effects due to elevated salinity or hypoxic conditions occurring outside the BMZ.
20	2.c(5)	Design outfall structures to minimize the suspension of benthic sediments.	Both outfall structure alternatives have been designed to minimize the suspension of benthic sediments. As described in Attachment A to the ROWD, a new multiport diffuser discharge system would be located approximately 4,000 ft. offshore, 3,280 ft. northwest of kelp beds. The diffuser system would be elevated off the seafloor and oriented to minimize the suspension of benthic sediments, in accordance with Ocean Plan provisions. As described in Attachment A to the ROWD, a flow augmentation discharge system would flow by gravity into the existing EPS discharge channel following dilution to 42 ppt by flow augmentation with additional seawater. Final dilution to comply with the receiving water limitation for salinity would be accomplished through natural mixing in the surf zone, thereby minimizing project-related suspension of benthic sediments.
-	2.d	Technology: Technology is the type of equipment, materials, and methods that are used to construct and operate the design components of the desalination facility. The regional water board shall apply the following considerations in determining whether a proposed technology is the best available technology feasible to minimize intake and mortality of all forms of marine life:	
21	2.d(1)(a)(i)	The regional water board shall consider the following factors in determining feasibility of subsurface intakes: geotechnical data, hydrogeology, benthic topography, oceanographic conditions, presence of sensitive habitats, presence of sensitive species, energy use for the entire facility; design constraints (engineering, constructability),	The San Diego Water Board concludes, as it did in the 2009 Determination, that subsurface intakes are not feasible at this time. The same considerations now required by Ocean Plan Chapter III.M.2.d(1)(a)(i) were

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		and project life cycle cost. Project life cycle cost shall be determined by evaluating the total cost of planning, design, land acquisition, construction, operations, maintenance, mitigation, equipment replacement and disposal over the lifetime of the facility, in addition to the cost of decommissioning the facility. Subsurface intakes shall not be determined to be economically infeasible solely because subsurface intakes may be more expensive than surface intakes. Subsurface intakes may be determined to be economically infeasible if the additional costs or lost profitability associated with subsurface intakes, as compared to surface intakes, would render the desalination facility not economically viable. In addition, the regional water board may evaluate other site- and facility-specific factors.	reviewed in the 2009 Determination and the information and conditions on which the findings were based, and those conditions have not changed since that time. See Findings 9 and 13 regarding geotechnical data, hydrogeology, benthic topography, oceanographic conditions, presence of sensitive habitats, and design constraints associated with subsurface intakes. See Appendices N and OO to the ROWD for information regarding life cycle costs for subsurface intakes. Further analysis of the intake alternatives including subsurface intake alternatives is provided in Attachment H.2 of this Order.
22	2.d(1)(a)(ii)	If the regional water board determines that subsurface intakes are not feasible for the proposed intake design capacity, it shall determine whether subsurface intakes are feasible for a reasonable range of alternative intake design capacities. The regional water board may find that a combination of subsurface and surface intakes is the best feasible alternative to minimize intake and mortality of marine life and meet the identified need for desalinated water as described in chapter III.M.2.b.(2).	The San Diego Water Board concluded in the 2009 Determination that subsurface intake alternatives were not feasible. The San Diego Water Board has reevaluated the feasibility of subsurface intakes for the Water Code section 13142.5(b) determination under this Order and finds that a combination of subsurface and surface intakes is not feasible at this time. A combination of a low-volume subsurface intake with a surface intake would be a very complex technical intake configuration with multiple pipelines, pumps, and infrastructure constructed on an already developed parcel of land with existing site constraints. The increased complexity and dual infrastructure needed for both a subsurface intake and surface water intake would be a cost multiplier on capital expenses, operation and maintenance, permitting, and other expenses associated with constructing a new intake system. These technical and economic considerations

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			would render a combination of intake technologies to be infeasible. See Findings 9, 10, 11, 12, 13, 14, 15, and 21 regarding the feasibility of subsurface intakes for a range of alternative intake design capacities.
23	2.d(1)(b)	Installation and maintenance of a subsurface intake shall avoid, to the maximum extent feasible, the disturbance of sensitive habitats and sensitive species.	The San Diego Water Board concluded in the 2009 Determination that subsurface intake alternatives were not feasible. See Finding 9 for further discussion of the environmental effects of the SIG alternatives. See Finding 11 and 21 for further discussion on avoiding sensitive habitats and sensitive species. See Appendices B, and II to the ROWD for information regarding the potential impacts from subsurface intakes.
24	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:	After analyzing Poseidon submittals regarding relevant geotechnical data, hydrogeology, benthic topography, oceanographic conditions, presence of sensitive habitats, presence of sensitive species, energy use for the entire facility, design constraints, and project life cycle costs, the San Diego Water finds that the surface intake configuration in Design Alternative 21 meets the requirements and conditions of chapter III.M.2.d.(1)(c) of the Ocean Plan. See Findings 25 through 28 for further discussion.
25	2.d(1)(c)i	The regional water board shall require that surface water intakes be screened. Screens must be functional while the facility is withdrawing seawater.	The Facility will be equipped with functioning screens while withdrawing seawater. See Finding 11 for more information. Further analysis of the intake and discharge alternatives is provided in Attachment H.2.
26	2.d(1)(c)ii	In order to reduce entrainment, all surface water intakes must be screened with a 1.0 mm (0.04 in) or smaller slot	The Facility's surface water intake will be screened with a 1.0 mm screen or smaller slot size screen. Design Alternative 21 complies with the 1.0 mm screening

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		size screen when the desalination facility is withdrawing seawater.	requirement and the 0.5 ft/sec or less through-screen velocity requirement. The 1.0 mm screening and the through-screen velocity standard set by the Ocean Plan minimizes the mortality to marine life due to impingement and entrainment. See Appendices B, J, K, P, X, Y, EE, FF, GG, HH, II, PP, SS, TT, YY, ZZ, AAA, BBB, CCC, DDD, EEE, and FFF to the ROWD. Further analysis of the intake and discharge alternatives is provided in Attachment H.2 of this Order.
27	2.d.(1)(c)iii	An owner or operator may use an alternative method of preventing entrainment so long as the alternative method results in intake and mortality of eggs, larvae, and juvenile organisms that is less than or equivalent to a 1.0 mm (0.04 in) slot size screen. The owner or operator must demonstrate the effectiveness of the alternative method to the regional water board. The owner or operator must conduct a study to demonstrate the effectiveness of the alternative method, and use an Empirical Transport Model (ETM)/ Area of Production Forgone (APF) approach to estimate entrainment. The study period shall be at least 12 consecutive months. Sampling for environmental studies shall be designed to account for variation in oceanographic or hydrologic conditions and larval abundance and diversity such that abundance estimates are reasonably accurate. Samples must be collected using a mesh size no larger than 335 microns and individuals collected shall be identified to the lowest taxonomical level practicable. The ETM/APF analysis shall evaluate entrainment for a broad range of species, species morphologies, and sizes under the environmental and operational conditions that are representative of the entrained species and the conditions at the full-scale desalination facility. At their discretion, the	The Facility's surface water intake will be screened with a 1.0 mm screen or smaller slot size screen. See Finding 11 for more information.

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		regional water boards may permit the use of existing entrainment data to meet this requirement.	
28	2.d(1)(c)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, ft/sec).	Design Alternative 21 complies with the 0.5 ft/sec through-screen velocity requirement. The 0.5 ft/sec standard set by the Ocean Plan minimizes mortality to marine life due to impingement. Further analysis of the intake and discharge alternatives is provided in Attachment H.2 of this Order.
29	2.d(2)(a)	The preferred technology for minimizing intake and mortality of all forms of marine life resulting from brine discharge disposal is to commingle brine with wastewater (e.g., agricultural, municipal, industrial, power plant cooling water, etc.) that would otherwise be discharged to the ocean. The wastewater must provide adequate dilution to ensure salinity of the commingled discharge meets the receiving water limitation for salinity in chapter III.M.3. Nothing in this section shall preclude future recycling of the wastewater.	The San Diego Water Board finds that wastewater is unavailable to dilute the Facility's brine discharge. See Finding 14 for more information.
30	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 BMZ, minimize the suspension of benthic sediments, and minimize mortality of all forms of marine life.	Poseidon projects that the total project cost for a multiport diffuser with a surface water intake is up to $458,639,220 in Appendix OO to the ROWD, Table 1, Surface Screened Intake with Multiport Diffuser. While the San Diego Water Board considered this cost projection, the conditional determination that flow augmentation is the best available feasible brine discharge technology is not based on the projected cost of a multiport diffuser but ~~B~~based ~~on this projection, the San Diego Water Board finds that multiport diffusers are not feasible at this time~~on available information that supports the conclusion that use of flow augmentation as an alternative brine discharge technology and a theoretical multiport diffuser will provide comparable intake and mortality of all forms of marine life pursuant to chapter III.M.2.d(2)(c).

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			Appendices B, N, II, and OO to the ROWD provide more information regarding the cost of construction and operation of a multiport diffuser. Further analysis of the intake and discharge alternatives is provided in Attachment H.2 of this Order.
31	2.d(2)(c)	Brine discharge disposal technologies other than wastewater dilution and multiport diffusers, ~~such as flow augmentation,~~ may be used if an owner or operator can demonstrate to the regional water board that the technology provides a comparable level of intake and mortality of all forms of marine life as wastewater dilution if wastewater is available, or multiport diffusers if wastewater is unavailable. The owner or operator must evaluate all of the individual and cumulative effects of the proposed alternative discharge method on the intake and mortality of all forms of marine life, including (where applicable); intake-related entrainment, osmotic stress, turbulence that occurs during water conveyance and mixing, and shearing stress at the point of discharge. When determining the intake and mortality associated with a brine discharge disposal technology or combination of technologies, the regional water board shall require the owner or operator to use empirical studies or modeling to:	To allow use of flow augmentation as an alternative brine discharge technology, the San Diego Water Board must consider whether the Discharger has demonstrated that flow augmentation provides a comparable level of intake and mortality of all forms of marine life as a multiport diffuser. The San Diego Water Board analyzed the information provided by Poseidon for intake and marine life mortality due to flow augmentation and the information provided by Poseidon for intake and marine life mortality due to a discharge from a theoretical multiport diffuser by calculating the required volume of water to dilute the discharge to meet the salinity receiving water limit. This volume was then multiplied by 0.23 (23%) to estimate the volume of water where shearing-related mortality occurs, as was reported by Foster et al[1] and referenced in the *Final Staff Report Including the Final Substitute Environmental Documentation* (SED)[3]. Finally, an estimate of the size of the Brine Mixing Zone was calculated using modeling and a theoretical diffuser. This area is 12.3 acres according to Appendix A to the ROWD. This analysis shows that the flow augmentation discharge technology provides a comparable level of intake and mortality of all forms of marine life as the theoretical multiport diffuser. See Appendices A, K, WW, ZZ, FFF, and GGG to the ROWD. A recent scientific report[2~~1~~] by Dr. Philip Roberts has refined the methods to calculate marine life mortality caused by a brine discharge through a diffuser. These refined methods

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			include a process to systematically determine the best available diffuser design to minimize mortality and the size of the BMZ. The San Diego Water Board ~~staff~~ analyzed potential diffuser designs using the methods in the most recent scientific report by Dr. Roberts and has estimated that the shearing-related mortality from the best available diffuser design is comparable to Poseidon's estimate of the additional intake-related mortality from the flow augmentation discharge technology. Specifically, a theoretical diffuser could be designed that would result in a volume of approximately 170 MGD exposed to shearing-related mortality and a potential BMZ that might be as low as 1 acre. Poseidon's estimate of mortality from using flow augmentation discharge technology includes a 171 to 196 MGD volume of intake~~-related mortality~~ with an APF of 76 to 88 acres and a BMZ of approximately 18.5 acres. The comparison of brine discharge technologies was conducted considering a "worst-case" scenario of the maximum brine discharge of 60 MGD. "Worst case" is the plant operating conditions that would most likely result in the highest threat to water quality. For a brine discharge of 60 MGD, a theoretical multiport diffuser would result in approximately 170 MGD of seawater compared to 171 MGD of seawater needed from flow augmentation to dilute 60 MGD of brine. Due to the Order's intake specification limiting the total intake of seawater to 299 MGD, if the flow augmentation was increased to 196 MGD, the plant could only produce approximately 48 MGD of brine which is less of a threat to water quality than the discharge of 60 MGD of brine. Therefore, the comparison of brine discharge technologies was done for a discharge of 60 MGD of brine.

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			Poseidon conducted an ETM/APF ~~similar~~ analysis in Appendix GGG to the ROWD that concluded a diffuser could be designed that would result in approximately 170 MGD of shearing related mortality. However, the Appendix GGG ETM/APF calculation for a diffuser inappropriately relied on larval length data from Agua Hedionda Lagoon rather than larval length data from the open ocean coastal area where a multiport diffuser would be located. Due to a lack of larval length data from the open ocean coastal area to calculate an ETM/APF value for a multiport diffuser, the Order requires the collection of entrainment data at the location of the theoretical multiport diffuser and an ETM/APF analysis based on those data within two years of this Order's effective date. While available information supports the conclusion that flow augmentation is the best available brine discharge technology feasible, greater confidence in the scientific determination that underlays the comparison of intake and mortality levels from multiport diffusers and flow augmentation can be provided through implementation of the Multiport Diffuser Analysis required in Section VI.C.2.a of the Order. See also Finding 36, below for further information on how the data will be used for subsequent comparison to the outcome of the flow augmentation discharge technology empirical study required in the Order, section VI.C.2.b. In Appendix N to the ROWD, Poseidon estimated the cost to construct a multiport diffuser with a surface water intake to be approximately $425 million. In Appendix EEE to the ROWD, Poseidon estimated the cost to construct Design Alternative 21, a surface water intake with WWS using flow augmentation discharge technology, to be $53 million. Poseidon's September 13, 2018 cost update for Alternative

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			21 put the expected cost of this alternative between $66.2 to $82.8 million. Based on these considerations with the information available ~~discussion above~~, the San Diego Water Board has conditionally determined that flow augmentation is the best available discharge technology feasible ~~at this time for the CDP~~. [See discussion in Finding II.D of the Order explaining that this Water Code section 13142.5(b) Determination is made conditional on the results of the Multiport Diffuser Analysis confirming the San Diego Water Board's conclusion that use of an alternative brine discharge technology pursuant to section III.M.2.d.(2)(c) of the Ocean Plan is permissible. If the study fails to confirm the comparability of intake and mortality of all forms of marine life from the two discharge technologies, then the Ocean Plan requires the San Diego Water Board to make a new Water Code section 13142.5(b) determination.] Due to uncertainties in estimating the marine life mortality through modeling and as required by the Ocean Plan, Section VI.C.2.b~~a.i.~~ of this Order requires a special study ~~to~~ consistent with the requirements in Ocean Plan chapter III.M.2.d.(2)(c)iv to further evaluate the intake and mortality of all forms of marine life associated with the discharge technology for permanent stand-alone operations. This study will evaluate the marine life mortality from a flow augmentation discharge with empirical observation data for direct comparison to the marine life mortality from a diffuser as required by chapter III.M.2.d.(2)(c)(v) of the Ocean Plan ~~as outlined above~~. If the study ~~shows~~ demonstrates that the flow augmentation discharge technology results in more intake and mortality of all forms of marine life than a Facility using ~~wastewater dilution or~~ multiport diffusers, then, as required

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			by Ocean Plan chapter III.M.2.d.(2)(c)v, the Facility must submit a proposed schedule to either: 1. Cease using the flow augmentation brine discharge technology and install and use wastewater dilution or multiport diffusers to discharge brine waste; or 2. Re-design the alternative flow augmentation discharge technology system to minimize intake and mortality of all forms of marine life to a level that is comparable with wastewater dilution if wastewater is available, or multiport diffusers if wastewater is unavailable, subject to San Diego Water Board approval. [1]Desalination Plant Entrainment Impacts and Mitigation. Expert Review Panel III, Foster et al, 2013 available at: https://www.waterboards.ca.gov/water_issues/programs/ocean/desalination/docs/erp_final.pdf (as of June 25, 2018) [2]Brine Diffusers and Shear Mortality, Philip J.W. Roberts, (Roberts Report) April 18, 2018 is available at the Santa Ana Water Board's website: https://www.waterboards.ca.gov/santaana/water_issues/programs/Wastewater/Poseidon/2018/4-18-18_Diffuser_Analysis_Method.pdf (as of June 25, 2018) [3]The Final Staff Report Including the Final Substitute Environmental Documentation is available at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/rs2015_0033_sr_apx.pdf ~~(Roberts' report)~~
32	2.d(2)(c)i	Estimate intake entrainment impacts using an ETM/APF approach.	Poseidon estimated the intake entrainment impacts from flow augmentation using an ETM/APF approach based on Appendix E to the Desalination Amendment Staff Report. The SAP reviewed Poseidon's APF and ETM calculations for flow augmentation and recommended that the ETM

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			calculations be consistent with the calculations conducted for the 2008 EPS Study, to account for the intake of marine life species from multiple source water bodies (i.e. Agua Hedionda Lagoon and the Pacific Ocean) rather than a single source water body (i.e. only Pacific Ocean). Poseidon revised the ETM calculations for flow augmentation as recommended by the SAP and provided the results as Appendix FFF to the ROWD. See Finding 31 and Appendices K, P, WW, FFF, and GGG to the ROWD. The San Diego Water Board evaluated this information in reaching its conclusion that the intake and mortality of all forms of marine life from flow augmentation and multiport diffusers are comparable~~is the best available discharge technology feasible~~. This conclusion is conditional on the outcome of the Multiport Diffuser Analysis, as described in Finding II.D of the Order.
33	2.d(2)(c)ii	Estimate degradation of all forms of marine life from elevated salinity within the BMZ, including osmotic stresses, the size of impacted area, and the duration that all forms of marine life are exposed to the toxic conditions. Considerations shall be given to the most sensitive species, and community structure and function.	Poseidon analyzed the potential for degradation to marine life due to elevated salinity within the BMZ. See Appendices C, G, H, I, L, BB, DD, QQ, UU, WW, XX and ZZ to the ROWD. The San Diego Water Board evaluated this information in reaching its conclusion that the intake and mortality of all forms of marine life from flow augmentation and multiport diffusers are comparable~~is the best available discharge technology feasible at this time~~. This conclusion is conditional on the outcome of the Multiport Diffuser Analysis as described in Finding II.D of the Order. This Order's Monitoring Reporting Program in Attachment E requires salinity monitoring within the BMZ to assess impacts and evaluate adverse changes in the environment due to elevated salinity.

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34	2.d(2)(c)iii	Estimate the intake and mortality of all forms of marine life that occurs as a result of water conveyance, in-plant turbulence or mixing, and waste discharge.	Poseidon estimated the intake and mortality of all forms of marine life that occurs as a result of water conveyance assuming 100 percent mortality of marine life entrained in the intake water. See Findings 31 and 32 and Appendices B, C, F, K, I, J, L, BB, DD, GG, HH, QQ, UU, WW, XX YY, and ZZ to the ROWD. The San Diego Water Board evaluated this information in reaching its conclusion ~~and concluded~~ that the intake and mortality of all forms of marine life from flow augmentation and multiport diffusers are comparable~~is the best available discharge technology feasible at this time~~. This conclusion is conditional on the outcome of the Multiport Diffuser Analysis, as described in Finding II.D of the Order.
35	2.d(2)(c)iv	Within 18 months of beginning operation, submit to the regional water board an empirical study that evaluates intake and mortality of all forms of marine life associated with the alternative brine discharge technology. The study must evaluate impacts caused by any augmented intake volume, intake and pump technology, water conveyance, waste brine mixing, and effluent discharge. Unless demonstrated otherwise, organisms entrained by the alternative brine discharge technology are assumed to have a mortality rate of 100 percent. The study period shall be at least 12 consecutive months. If the regional water board requires a study period longer than 12 months, the final report must be submitted to the regional water board within 6 months of the completion of the empirical study.	Section VI.C.2.b~~a~~ of this Order requires an empirical study to evaluate intake and mortality of all forms of marine life associated with the flow augmentation discharge. See Finding 31 for more information on the special study.
36	2.d(2)(c)v	If the empirical study shows that flow augmentation, the alternative brine discharge disposal technology, results in more intake and mortality of all forms of marine life than a facility using wastewater dilution or multiport diffusers, then the facility must either (1) cease using flow augmentation the alternative brine discharge technology and install and	Section VI.C.2.b~~a~~ of this Order requires an empirical study to evaluate intake and mortality of all forms of marine life associated with the flow augmentation discharge. If the study shows that flow augmentation results in more intake and mortality than multiport diffusers, the Discharger will be required to either (1) cease using flow augmentation as

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		use wastewater dilution or multiport diffusers to discharge brine waste, or (2) re-design the flow augmentation the alternative brine discharge technology system to minimize intake and mortality of all forms of marine life to a level that is comparable with wastewater dilution if wastewater is available, or multiport diffusers if wastewater is unavailable, subject to regional water board approval.	an alternative brine discharge technology and install and use wastewater dilution or multiport diffusers to discharge brine waste or (2) re-design the flow augmentation brine discharge technology system to minimize intake and mortality of all forms of marine life to a level that is comparable with wastewater dilution, if available, or multiport diffusers if wastewater dilution is unavailable. Such modifications or redesign are subject to San Diego Water Board approval in consultation with appropriate state agencies. Poseidon may request a time schedule to comply with these requirements including but not limited to cease or redesign the discharge technology. See Finding 31 for more information on the special study.
37	2.d(2)(d)(ii)	[Flow Augmentation as an alternative brine discharge technology is prohibited with the following exceptions:] At a facility that has received a conditional Water Code section 13142.5(b) determination and is over 80 percent constructed by January 28, 2016. If the owner or operator of the facility proposes ~~proposing~~ to use flow augmentation as an alternative brine discharge technology, the facility must: use low turbulence intakes (e.g., screw centrifugal pumps or axial flow pumps) and conveyance pipes; convey and mix dilution water in a manner that limits thermal stress, osmotic stress, turbulent shear stress, and other factors that could cause intake and mortality of all forms of marine life; comply with chapter III.M.2.d(1); and not discharge through multiport diffusers.	The San Diego Water Board finds that the Facility meets the ~~Ocean Plan's~~ criteria in this Ocean Plan provision for continued use of flow augmentation as an alternative brine discharge technology. The Facility received a conditional Water Code section 13142.5(b) determination in 2009 for co-located operations and temporary stand-alone operations (2009 Determination) and was over 80 percent constructed by January 28, 2016. Poseidon proposes to retrofit the Facility with a low turbulence intake (e.g., screw centrifugal pumps or axial flow pumps) and conveyance pipes. Additionally, the new pumps will convey and mix dilution water in a manner that limits thermal stress, osmotic stress, turbulent shear stress, and other factors that could cause intake and mortality of all forms of marine life. On this basis, the San Diego Water Board finds that the requirements of chapter III.M.2.d.(2)(d)(ii) have been satisfied. See Finding 31 and Appendices B, G, H, I, J, K, L, FFF, and GGG to the

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			ROWD. Further analysis of the intake and discharge alternatives is provided in Attachment H.2 of this Order.
-	2.e	Mitigation: for the purposes of this section mitigation is the replacement of all forms of marine life or habitat that is lost due to the construction and operation of a desalination facility after minimizing intake and mortality of all forms of marine life through best available site, design, and technology. The regional water board shall ensure an owner or operator fully mitigates for the operational lifetime of the facility and uses the best available mitigation measures feasible to minimize intake and mortality of all forms of marine life. The owner or operator may choose whether to satisfy a facility's mitigation measures pursuant to chapter III.M.2.e.(3), or if available, M.2.e.(4), or a combination of the two.	
38	2.e(1)	Marine Life Mortality Report. The owner or operator of a facility shall submit a report to the regional water board estimating the marine life mortality resulting from construction and operation of the facility after implementation of the facility's required site, design, and technology measures.	Appendices A, B, II, and ZZ to the ROWD provide estimated impacts to all forms of marine life resulting from various intake and discharge alternatives under consideration for the Facility.
39	2.e(1)(a)	For operational mortality related to intakes, the report shall include a detailed entrainment study. The entrainment study period shall be at least 12 consecutive months and sampling shall be designed to account for variation in oceanographic or hydrologic conditions and larval abundance and diversity such that abundance estimates are reasonably accurate. At their discretion, the regional water boards may permit the use of existing entrainment data from the facility to meet this requirement. Samples must be collected using a mesh size no larger than 335 microns and individuals collected shall be identified to the lowest taxonomical level practicable. The ETM/APF analysis shall be representative of the entrained species collected using the 335 micron net. The APF shall be calculated using a one-sided, upper 95 percent confidence bound for the 95th percentile of the APF distribution. An owner or operator with subsurface intakes is not required to do an ETM/APF analysis for their intakes and is not required to mitigate for intake-related operational mortality.	Poseidon submitted an entrainment study in Appendix K to the ROWD and a minimization plan in Appendix P to the ROWD that addresses this Ocean Plan requirement. Appendices K and P relied on data from the 2008 EPS Study. In support of the 2009 Determination for co-located operations, the 2008 EPS Study and other studies produced in support of Poseidon's permitting applications were reviewed by Dr. Peter Raimondi, an academic researcher with extensive experience evaluating entrainment studies on behalf of California state agencies, including the Coastal Commission and the San Diego Water Board. Dr. Raimondi reported that the 2008 EPS Study and Poseidon's use of the entrainment data for the CDP were consistent with the best available science (see Appendix K to the ROWD) and concluded that the study provided adequate data to determine the types and numbers of organisms that would be subject to entrainment. Accordingly, the San Diego Water Board concludes that the use of the entrainment data from the

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		The regional water board may apply a one percent reduction to the APF acreage calculated in the Marine Life Mortality Report to account for the reduction in entrainment of all forms of marine life when using a 1.0 mm slot size screen.	2008 EPS Study to assess the operational mortality related to the Facility's intake is appropriate. The SAP reviewed Poseidon's APF and ETM calculations. The SAP recommended that the ETM calculations be consistent with the calculations conducted for the 2008 EPS Study, to account for the intake of marine life species from multiple source water bodies (i.e. Agua Hedionda Lagoon and the Pacific Ocean) rather than a single source water body (i.e. only Agua Hedionda Lagoon). Poseidon revised the ETM calculations as recommended by the SAP and provided the results to the San Diego Water Board as Appendix FFF and GGG to the ROWD. See Finding 32. The SAP calculated the APF for entrainment to be 66.63 acres. With a 1 percent reduction when using the 1.0 mm slot size screen, the total APF for entrainment is 65.97 acres. Poseidon will use a 1.0 mm slot size screen and therefore qualifies for a 1 percent reduction to the APF acreage.
40	2.e.(1).(b)	For operational mortality related to discharges, the report shall estimate the area in which salinity exceeds 2.0 parts per thousand above natural background salinity or a facility-specific alternative receiving water limitation (see chapter III.M.3). The area in excess of the receiving water limitation for salinity shall be determined by modeling and confirmed with monitoring. The report shall use any acceptable approach approved by the regional water board for evaluating mortality that occurs due to shearing stress resulting from the facility's discharge, including any incremental increase in mortality resulting from a commingled discharge.	The area in which the flow augmentation discharge exceeds 2.0 ppt above the natural background salinity is approximately the shape of a semicircle extending 200 meters (656 ft.) from the end of the discharge jetty. Appendices XX and ZZ to the ROWD calculated the area impacted within the BMZ to be 18.5 acres. The size of the BMZ was determined through hydrodynamic modeling studies and will be verified through receiving water monitoring required in this Order. The diffuser brine discharge alternative consists of four duckbill ports located 100 ft. apart, which would discharge the brine into the water column at a high velocity to promote rapid diffusion and dispersion. The BMZ would extend 100 meters (328 ft.) out from each of the four

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			discharge points with the combined area inside the BMZ covering 12.3 acres as calculated in Appendix ZZ to the ROWD.
41	2.e(1)(c)	For construction-related mortality, the report shall use any acceptable approach approved by the regional water board for evaluating the mortality that occurs within the area disturbed by the facility's construction. The regional water board may determine that the construction-related disturbance does not require mitigation because the disturbance is temporary and the habitat is naturally restored.	Construction-related marine life mortality impacts depend on the intake structure design. In Appendix EEE to the ROWD, Poseidon estimates that the permanent impacts from construction and installation of WWS in the lagoon for Design Alternative 21 would result in 0.2 acres of permanent impacts. However, these impacts are expected to be temporary in nature when the intake pipe laterals from the WWS to the shoreline are buried with sediment, which would eventually restore the benthic habitat to pre-project conditions. In Appendices B and ZZ to the ROWD, Poseidon estimates that a multiport diffuser alternative for the brine discharge would have four acres of temporary impacts to marine habitat during construction, with 12.3 acres of permanent impacts remaining after construction. The flow augmentation alternative for brine discharge would not require additional construction at the discharge point and no construction related impacts to the marine habitat are identified at the discharge point. Further analysis of the intake and discharge alternatives is provided in Attachment H.2 of this Order
42	2.e(1)(d)	Upon approval of the report by the regional water board in consultation with State Water Board staff, the calculated marine life mortality shall form the basis for the mitigation provided pursuant to this section.	The wetland mitigation area required for marine life mortality impacts related to the CDP's permanent stand-alone operations is 68.30 acres, which includes a mitigation ratio of 1 acre of mitigation for every 10 acres of impacted soft bottom or open ocean habitat. Of that total, 65.97 acres is due to marine life impacts from entrainment, including a 1 percent reduction to the APF that accounts for the reduction in entrainment when using a 1.0 mm slot

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			size screen. The permanent construction related impacts to marine life from Design Alternative 21 are 0.2 acres of benthic habitat in Agua Hedionda Lagoon. Total impacts within the BMZ are calculated to be 18.5 acres: 18.2 acres of soft bottom habitat, with a mitigation ratio of 1 acre of mitigation for every 10 acres of soft bottom, open ocean habitat, and 0.31 acres of rocky jetty habitat, with a mitigation ratio of 1 acre of mitigation for every 1 acre of habitat. Therefore, the total mitigation required for the impacts to the BMZ is 2.13 acres.
43	2.e(2)	The owner or operator shall mitigate for the mortality of all forms of marine life determined in the report above by choosing to either complete a mitigation project as described in chapter III.M.2.e.(3) or, if an appropriate fee-based mitigation program is available, provide funding for the program as described in chapter III.M.2.e.(4). The mitigation project or the use of a fee-based mitigation program and the amount of the fee that the owner or operator must pay is subject to regional water board approval.	On May 13, 2009, the San Diego Water Board adopted Order No. 2009-0038, amending Order No. 2006-0065 to require 55.4 acres of wetland mitigation for impacts attributable to co-located and temporary stand-alone operations of the Facility. Finding 41 of the 2009 Determination states, “The Marine Life Mitigation Plan (MLMP) was written for stand-alone operation, and proposes phased implementation of up to 55.4 acres of wetland mitigation within the Southern California Bight.” Finding 46 of the 2009 Determination states, “It is appropriate to establish a fish productivity requirement that must be achieved to compensate for projected impingement based on the estimate of 4.7 kg/day. Based on this estimate, it is reasonable to establish 1,715.5 kg/year as the fish productivity requirement. This requirement will be considered a ‘Biological Performance Standard’ under section 5A.b. of the MLMP.” Section VI.C.2.e.a. of Order R9-2006-0065, as amended, provides that the Executive Officer of the San Diego Water Board shall consider any adjustment to the biological

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			performance standard/fish productivity standard for the next permit cycle. Section VI.C.2.e.b. of Order R9-2006-0065, as amended provides that the Discharger can propose modification and variations from Allen's productivity methodologies used for monitoring the biological performance standard of the mitigation, following review by the SAP and approval by the Executive Officer. Subsequently, in September 2009, Poseidon in consultation with the Coastal Commission agreed to provide an additional 11 acres of mitigation, bringing the total wetland mitigation area required for co-located and temporary stand-alone operations to 66.4 acres. The SAP reviewed the biological performance standard and concluded that the additional 11 acres of mitigation, as required by the Coastal Commission, would compensate for the 1,715.5 kg/year biological productivity requirement required in the San Diego Water Board's 2009 Determination. The SAP recommended comparing the mitigation wetland to reference wetlands to assess the overall wetland function rather than the biological productivity. Poseidon proposed to implement the mitigation required in the 2009 Determination through restoration of native wetland habitat within the San Diego Bay NWR managed by the USFWS. Consistent with the Ocean Plan, the San Diego Water Board incorporates the previously approved mitigation project in determining mitigation requirements for any additional mortality of all forms of marine life resulting from the occurrence of the conditional event or expansion of the Facility. Nonetheless, additional mitigation is required to compensate for any additional construction, discharge or

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			other increases in intake or impacts or an increase in intake and mortality of all forms of marine life. For permanent stand-alone operations implementing Design Alternative 21 with WWS within the Lagoon, the mitigation required is 68.3 acres (see Finding 42 for more information). The San Diego Water Board has credited the previously approved 66.4 acres of wetland mitigation area towards providing the 68.3 acres of mitigation required for impacts attributable to the CDP's permanent stand-alone operations. Accordingly, Poseidon must provide 1.9 acres of additional wetland mitigation area to offset impacts from permanent stand-alone operations. Section VI.C.2.dc of this Order requires Poseidon to develop and submit a permanent stand-alone mitigation plan providing for the additional 1.9 acres of mitigation needed for approval by the San Diego Water Board. For more information please see Appendices ZZ and EEE to the ROWD and mitigation calculations provided by Poseidon on October 22, 2018
44	2.e(3)	Mitigation Option 1: Complete a Mitigation Project. The mitigation project must satisfy the following provisions:	See Findings 43, and 45 through 55.
45	2.e(3)(a)	The owner or operator shall submit a Mitigation Plan. Mitigation Plans shall include: project objectives, site selection, site protection instrument (the legal arrangement or instrument that will be used to ensure the long-term protection of the compensatory mitigation project site), baseline site conditions, a mitigation work plan, a maintenance plan, a long-term management plan, an adaptive management plan, performance standards and success criteria, monitoring requirements, and financial assurances.	The MLMP in Appendix P to the ROWD was developed by Poseidon in consultation with the San Diego Water Board, and was approved by the Coastal Commission and finalized on November 21, 2008. The MLMP in Appendix P to the ROWD requires Poseidon to restore at least 66.4 acres of wetland native habitats to offset habitat impacts attributable to co-located and temporary stand-alone Facility operations. See Finding 43. The mitigation project to meet the MLMP requirements is referred to as the Otay River Estuary Restoration Project.

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			The Project site is located at the south end of San Diego Bay, San Diego County, California, within the South San Diego Bay Unit of the San Diego Bay NWR. Restoration activities will occur at two separate locations within the Refuge: 1) Otay River Floodplain Site, and 2) Pond 15 Site. Specifically, the approximately 34-acre Otay River Floodplain Site is located west of Interstate 5 between Main Street to the north and Palm Avenue to the south in the City of San Diego. The Pond 15 Site consists of an approximately 91-acre active solar salt pond located in the northeast portion of the refuge, located northwest of the intersection of Bay Boulevard and Palomar Street in Chula Vista. See Finding 43. The MLMP will need to be updated to reflect the increase in wetland mitigation area requirements needed to fully offset impacts attributable to permanent stand-alone operations. See Findings 36 and 43, and see Appendices P, ZZ, and EEE to the ROWD. and the mitigation calculations provided by Poseidon on October 22, 2018.
46	2.e(3)(b)i	Mitigation shall be accomplished through expansion, restoration or creation of one or more of the following: kelp beds, estuaries, coastal wetlands, natural reefs, MPAs, or other projects approved by the regional water board that will mitigate for intake and mortality of all forms of marine life associated with the facility.	On March 10, 2011, the San Diego Water Board adopted Resolution No. R9-2011-0028[1], approving Poseidon's MLMP and the selection of locations with the San Diego Bay NWR as the wetland mitigation site. See Findings 43 and 45. The SAP concluded that Poseidon's Otay River Estuary Restoration Project would adequately compensate for intake-related impacts under permanent stand-alone operation. The SAP did not comment on mitigation needed to compensate for the impacts attributable to Facility discharge or construction. The marine life impacts due to the discharge from the Facility and from the construction of the new intake were accounted for in Finding 42, above,

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			based on the information provided in Appendix EEE to the ROWD. [1]Resolution No. R9-2011-0028 is available on the San Diego Water Board website at: https://www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/docs/Resolution_R9_2011_0028.pdf (as of June 25, 2018)
47	2.e(3)(b)ii	The owner or operator shall demonstrate that the project fully mitigates for intake-related marine life mortality by including expansion, restoration, or creation of habitat based on the APF acreage calculated in the Marine Life Mortality Report above. The owner or operator using surface water intakes shall do modeling to evaluate the areal extent of the mitigation project's production area to confirm that it overlaps the facility's source water body. Impacts on the mitigation project due to entrainment by the facility must be offset by adding compensatory acreage to the mitigation project.	Poseidon is required to establish 1.9 acres in addition to the previously approved 66.4 acres of wetland mitigation. Section VI.C.6 of this Order requires Poseidon to develop and submit a permanent stand-alone mitigation plan to provide the additional 1.9 acres of wetland mitigation for approval by the San Diego Water Board in consultation with the State Water Board. Monitoring of the completed mitigation project will be performed to confirm that the project meets the mitigation requirements. See Finding 44. The Ocean Plan allows the San Diego Water Board to account for previously-approved mitigation projects in determining mitigation requirements for any additional mortality of all forms of marine life resulting from the occurrence of the conditional event or expansion of the Facility. Additional mitigation must compensate for any additional construction, discharge or other increases in intake or impacts or an increase in intake and mortality of all forms of marine life. The San Diego Water Board has decided to account for the previously approved 66.4-acre mitigation project in requiring 68.3 acres of mitigation to offset impacts from stand-alone operations.
48	2.e(3)(b)iii	The owner or operator shall demonstrate that the project also fully mitigates for the discharge-related marine life	See Findings 41 and 44.

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		mortality projected in the Marine Life Mortality Report above.	
49	2.e(3)(b)iv	The owner or operator shall demonstrate that the project also fully mitigates for the construction-related marine life mortality identified in the Marine Life Mortality Report above.	See Findings 42 and 44.
50	2.e(3)(b)v	The regional water board may permit out-of-kind mitigation for mitigation of open water or soft-bottom species. In-kind mitigation shall be done for all other species whenever feasible.	See Findings 44 and 47.
51	2.e(3)(b)vi	For out-of-kind mitigation, an owner or operator shall evaluate the biological productivity of the impacted open water or soft-bottom habitat calculated in the Marine Life Mortality Report and the proposed mitigation habitat. If the mitigation habitat is a more biologically productive habitat (e.g. wetlands, estuaries, rocky reefs, kelp beds, eelgrass beds, surfgrass beds), the regional water boards may apply a mitigation ratio based on the relative biological productivity of the impacted open water or soft-bottom habitat and the mitigation habitat. The mitigation ratio shall not be less than one acre of mitigation habitat for every ten acres of impacted open water or soft-bottom habitat.	The habitat impacted by the construction and operation of the intake and discharge structures includes open water, soft-bottom, estuarine, and rocky habitats. See Appendices ZZ and EEE to the ROWD). Poseidon will construct the Otay River Estuary Restoration Project that will restore wetland habitat as described in Findings 43, 44, and 47. Accordingly, the San Diego Water Board approves Poseidon's request to apply a mitigation ratio of one acre of mitigation habitat for every ten acres of impacted open water or soft-bottom habitat.
52	2.e(3)(b)vii	For in-kind mitigation, the mitigation ratio shall not be less than one acre of mitigation habitat for every one acre of impacted habitat.	Poseidon proposes a mitigation ratio of one acre of mitigation habitat for every one acre of impacted estuarine or rocky habitat. The SAP evaluated Poseidon's ETM/APF analyses by habitat classification and found that Poseidon used the appropriate designations in their ETM/APF calculation. The San Diego Water Board has reviewed the mitigation ratios and finds that Poseidon's proposal meets the requirements of this chapter. See Findings 42, 44 and 47.

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53	2.e(3)(b)viii	For both in-kind and out-of-kind mitigation, the regional water boards may increase the required mitigation ratio for any species and impacted natural habitat calculated in the Marine Life Mortality Report when appropriate to account for imprecisions associated with mitigation, including but not limited to, the likelihood of success, temporal delays in productivity, and the difficulty of restoring or establishing the desired productivity functions.	The Facility commenced discharge in December 2015, and the construction of the Otay River Estuary Restoration Project has not yet begun. Section VI.C.6 of the Order requires Poseidon to develop a mitigation plan for approval by the San Diego Water Board to offset the temporal losses in fish productivity occurring while the Facility is being operated prior to the mitigation project meeting performance standards. Poseidon is therefore required to maintain the mitigation project as long as necessary to fully account for the temporal loss of fish productivity during the time between the start of operations of the Facility and when the mitigation project meets performance standards. See Finding 43. In the interim time between the EPS cessation of power generating activities and the operation of the new intake pumps, the Facility will be intaking up to 330 MGD of seawater, which is 31 MGD more than the 299 MGD contemplated in Finding 43. The Tentative Order at section VI.C.2.d.i.(f) requires Poseidon to mitigate for the additional impacts from the additional intake of seawater during the interim period.
54	2.e(3)(b)ix	The rationale for the mitigation ratios must be documented in the administrative record for the permit action.	The wetland mitigation area required for marine life mortality impacts related to the CDP's permanent stand-alone operations is 68.30 acres, which includes a mitigation ratio of 1 acre of mitigation for every 10 acres of soft bottom or open ocean habitat. Of that total, 65.97 acres is due to marine life impacts from entrainment, including a 1 percent reduction to the APF that accounts for the reduction in entrainment when using a 1.0 mm slot size screen. The permanent construction impacts from Design Alternative 21 are 0.2 acres of benthic habitat in Agua Hedionda Lagoon.

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			Total impacts within the BMZ are calculated to be 18.5 acres: 18.2 acres of soft bottom habitat, with a mitigation ratio of 1 acre of mitigation for every 10 acres of soft bottom, open ocean habitat, and 0.31 acres of rocky jetty habitat, with a mitigation ratio of 1 acre of mitigation for every 1 acre of habitat. Therefore, the total mitigation required for the 18.5 acres of impacts to the BMZ is 2.13 acres of mitigation. The San Diego Water Board has reviewed and concludes that the mitigation ratios are consistent with the Ocean Plan's requirements for 1:1 in-kind mitigation for impacts to estuarine species and the rocky jetty habitat, and 10:1 mitigation for open ocean water habitat and soft bottom habitat impacted by Facility operations. See Findings 44 and 52, Appendix ZZ to the ROWD, and in Order No. R9-2009-0038.
55	2.e(3)(c)	The Mitigation Plan is subject to approval by the regional water board in consultation with State Water Board staff and with other agencies having authority to condition approval of the project and require mitigation.	The San Diego Water Board has consulted with State Water Board, the Coastal Commission, and the CDFW in the development and 2009 approval of the MLMP. Future revisions of the MLMP will be approved by the San Diego Water Board in consultation with the State Water Board, Coastal Commission, and CDFW. Please see Findings 44 and 47.
56	2.e(4)	Mitigation Option 2: Fee-based Mitigation Program. If the regional water board determines that an appropriate fee-based mitigation program has been established by a public agency, and that payment of a fee to the mitigation program will result in the creation and ongoing implementation of a mitigation project that meets the requirements of chapter M.2.e.(3), the owner or operator may pay a fee to the mitigation program in lieu of completing a mitigation project.	Poseidon has chosen not to pursue this mitigation option.

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57	2.e(4)(a)	The agency that manages the fee-based mitigation program must have legal and budgetary authority to accept and spend mitigation funds, a history of successful mitigation projects documented by having set and met performance standards for past projects, and stable financial backing in order to manage mitigation sites for the operational life of the facility.	Poseidon has chosen not to pursue this mitigation option.
58	2.e(4)(b)	The amount of the fee shall be based on the cost of the mitigation project, or if the project is designed to mitigate cumulative impacts from multiple desalination facilities or other development projects, the amount of the fee shall be based on the desalination facility's fair share of the cost of the mitigation project.	Poseidon has chosen not to pursue this mitigation option.
59	2.e(4)(c)	The manager of the fee-based mitigation program must consult with the California Department of Fish and Wildlife, Ocean Protection Council, Coastal Commission, State Lands Commission, and State and regional water boards to develop mitigation projects that will best compensate for intake and mortality of all forms of marine life caused by the desalination facility. Mitigation projects that increase or enhance the viability and sustainability of all forms of marine life in Marine Protected Areas are preferred, if feasible.	Poseidon has chosen not to pursue this mitigation option.
60	2.e(5)	California Department of Fish and Wildlife, the regional water board, and State Water Board may perform audits or site inspections of any mitigation project.	Section VI.C.6 of the Order requires Poseidon to develop a permanent stand-alone mitigation plan to compensate for additional impacts caused from permanent stand-alone operations, for approval by the San Diego Water Board's Executive Officer. Consistent with the Ocean Plan, the CDFW, the San Diego Water Board, and the State Water Board are authorized to perform audits or site inspections of any mitigation project.

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61	2.e(6)	An owner or operator, or a manager of a fee-based mitigation program, must submit a mitigation project performance report to the regional water board 180 days prior to the expiration date of their NPDES permit.	Poseidon has chosen not to pursue a fee-based mitigation option.
62	2.e(7)(a)	For conditionally permitted facilities or expanded facilities, the regional water boards may: Account for previously-approved mitigation projects associated with a facility when making a new Water Code section 13142.5(b) determination.	The Ocean Plan allows the San Diego Water Board to account for previously-approved mitigation projects in determining mitigation requirements for any additional mortality of all forms of marine life resulting from the occurrence of the conditional event or expansion of the Facility. Additional mitigation is required to compensate for any additional construction, discharge or other increases in intake or impacts or an increase in intake and mortality of all forms of marine life. The San Diego Water Board has elected to account for the previously approved 66.4-acre mitigation project toward the 68.3 acres of mitigation now required to offset impacts from stand-alone operations. Therefore, an additional 1.9 acres of mitigation is required for permanent stand-alone operations either through the mitigation acreage established at the Otay River Estuary Restoration Project or by proposing a new mitigation project. See Finding 43.
63	2.e(7)(b)	For conditionally permitted facilities or expanded facilities, the regional water boards may: Require additional mitigation when making a new Water Code section 13142.5(b) determination for any additional mortality of all forms of marine life resulting from the occurrence of the conditional event or the expansion of the facility. The additional mitigation must be to compensate for any additional construction, discharge, or other increases in intake or impacts or an increase in intake and mortality of all forms of marine life.	Additional mitigation is required in section VI.C.2.d~~c~~ of this Order to address marine life impacts from permanent stand-alone operations. See Finding 43.

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-	3	**Receiving Water Limitations for Salinity**	
64	3.b(1)	Discharges shall not exceed a daily maximum of 2.0 parts per thousand (ppt) above natural background salinity measured no further than 100 meters (328 ft) horizontally from each discharge point. There is no vertical limit to this zone.	The Ocean Plan's receiving water limitation for salinity provides that the Facility's discharge shall not exceed 2.0 ppt above natural background salinity measured no further than 100 meters (328 ft.) horizontally from the end of the Facility discharge jetty. The Ocean Plan requires that the standard BMZ not exceed 100 meters (328 ft.) laterally from the points of discharge and throughout the water column. The Ocean Plan also provides for an alternative BMZ, if approved by the San Diego Water Board as described in Ocean Plan chapter III.M.3.d, that shall not exceed 200 meters (656 ft.) laterally from the points of discharge and throughout the water column. Appendices CC, BB, QQ, and VV to the ROWD demonstrate~~s~~ that a BMZ of 200 meters (656 ft.) is necessary to meet the Ocean Plan's receiving water limitation for salinity of not exceeding 2 ppt above natural background. Chapter III.M.3.d of the Ocean Plan allows a BMZ up to 200 meters (656 ft.) laterally from each discharge point for dischargers that 1) have received a conditional Water Code section 13142.5(b) determination, 2) were over 80 percent constructed by January 28, 2016, and 3) propose flow augmentation using a surface water intake. See Finding 65. To justify approval of a BMZ greater than 100 meters, Poseidon must demonstrate that the combination of the expanded BMZ and flow augmentation using a surface water intake provides a comparable level of intake and mortality of all forms of marine life as the combination of the standard BMZ and wastewater dilution if wastewater is available, or multiport diffusers if wastewater is

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			unavailable. Additionally, the discharge must not result in hypoxic conditions outside the BMZ. Poseidon meets the requirements for an expanded BMZ because the Facility previously received a Water Code section 13142.5(b) determination (2009 Determination), was over 80 percent constructed prior to January 28, 2016, and proposes to use flow augmentation. Appendices BB, CC, QQ and VV to the ROWD demonstrates that a BMZ of 200 meters (656 ft.) satisfies the Ocean Plan's salinity water quality objective. Consideration of available dilution and anticipated discharge salinity indicates that Poseidon can comply with a daily maximum of 2.0 ppt above natural background salinity (i.e. 35.5 ppt) within 200 meters (656 ft.). This Order requires that Poseidon meet the receiving water salinity limit at the edge of a 200 meter (656 ft.) BMZ. In addition, in support of this application, Poseidon submitted an entrainment study, based on Tenera Environmental's 2008 Encina Power Station Clean Water Act Section 316(b) Impingement Mortality and Entrainment Characterization Study, as Appendix K of the 2015 ROWD. Poseidon subsequently revised the entrainment effects calculations as recommended by the SAP and provided the results as Appendices FFF and GGG to the ROWD, which the San Diego Water Board has reviewed and assessed. The San Diego Water Board finds that an expanded BMZ will not result in hypoxic conditions outside the BMZ, will not encompass or otherwise adversely affect existing sensitive habitat, and will not negatively impact sensitive habitats, sensitive species, MPAs, or SWQPAs.

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65	3.b(2)	In determining an effluent limit necessary to meet this receiving water limitation, permit writers shall use the formula in chapter III.C.4 that has been modified for brine discharges as follows: Equation 1: Ce= Co + Dm(2.0 ppt) Ce= (2.0 ppt + Cs) + Dm(2.0 ppt) Where: Ce= the effluent concentration limit, ppt Co= the salinity concentration to be met at the completion of initial dilution= 2.0 ppt + Cs Cs= the natural background salinity, ppt Dm= minimum probable initial dilution expressed as parts seawater per part brine discharge.	Appendix VV to the ROWD specifies the need for a BMZ which extends to a distance of 200 meters (656 ft.) horizontally from the point of discharge at the end of the discharge jetty, with a receiving water dilution factor of 3.31 parts seawater per part wastewater (3.31:1) for the diluted discharge. Consistent with chapter III.M.3.d of the Ocean Plan, this Order establishes an expanded BMZ of 200 meters (656 ft.). See Finding 70. To calculate the effluent limit(s) necessary to meet the receiving water limitation at the edge of the BMZ, the Ocean Plan establishes the following formula: Ce = (2.0 ppt + Cs) + Dm(2.0 ppt) Where: Ce = the maximum daily effluent concentration limit in ppt Co = the salinity concentration to be met at the BMZ Cs = the natural background salinity (defined as a 20-year monthly mean) Dm = minimum probable initial dilution expressed as parts seawater per part brine discharge As described in section IV.C.5 of the Fact Sheet to this Order, the natural background salinity at Scripps Pier was analyzed from 1993 through 2012, and the monthly means were calculated. The monthly means range from 33.4 ppt to 33.7 ppt. Using the lowest background salinity (applicable for January, February, and March; representative of the most conservative limitation), the following salinity effluent limitation would result: Ce = (2.0 ppt + 33.4 ppt) + 3.31(2.0 ppt) = 42 ppt.

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			Poseidon has specified that effluent will not exceed 42 ppt, and the supporting studies (antidegradation analysis, hydrodynamic discharge study, acute and chronic toxicity studies) all rely on an effluent concentration not to exceed 42 ppt. Furthermore, an effluent limitation of 42 ppt in the Hydrodynamic Discharge Study (Appendices C, BB, and QQ to the ROWD), is representative of a receiving water dilution of 3.25:1, and is anticipated to be protective of water quality and beneficial uses. The proposed effluent limitation of 42 ppt, measured at the discharge pond, is anticipated to be conservative and protective during all months of the year, and on that basis, the San Diego water Board has determined that an effluent limitation for salinity of 42 ppt is appropriate.
66	3.b(2)(a)	The fixed distance referenced in the initial dilution definition shall be no more than 100 meters (328 ft.).	See Findings 64, 65 and 70.
67	3.b(2)(b)	In addition, the owner or operator shall develop a dilution factor (Dm) based on the distance of 100 meters (328 ft.) or initial dilution, whichever is smaller. The dilution factor (Dm) shall be developed within the BMZ using applicable water quality models that have been approved by the regional water boards in consultation with State Water Board staff.	Poseidon meets the requirements to apply for an expanded BMZ because the Facility previously received a Water Code section 13142.5(b) determination (2009 Determination), was over 80 percent constructed prior to January 28, 2016, and proposes to use flow augmentation. Appendix VV to the ROWD demonstrates that a BMZ of 200 meters (656 ft.) is necessary to meet the Ocean Plan's receiving water limitation for salinity. At a distance of 200 meters (656 ft.), Appendices VV provides that the dilution factor is 3.31 for the flow augmented brine discharge. See Findings 64, 65 and 70.
68	3.c	An owner or operator may submit a proposal to the regional water board for approval of an alternative (other than 2 ppt) salinity* receiving water limitation to be met no further than 100 meters horizontally from the discharge. There is no vertical limit to this zone.	Poseidon initially requested a facility-specific alternative receiving water limitation for salinity (see Appendix A to the ROWD) but did not ~~provide~~ pursue this request in the development of the ROWD. Consequently, the ROWD does not include adequate technical supporting information

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			to demonstrate that an alternative receiving water limitation would be protective of water quality standards.
69	3.d	The owner or operator of a facility that has received a conditional Water Code section 13142.5(b) determination and is over 80 percent constructed by [the effective date of this plan] that proposes flow augmentation using a surface water intake may submit a proposal to the regional water board in consultation with the State Water Board staff for approval of an alternative BMZ not to exceed 200 meters laterally from the discharge point and throughout the water column. The owner or operator of such a facility must demonstrate, in accordance with chapter III.M.2.d.(2)(c), that the combination of the alternative BMZ and flow augmentation using a surface water intake provide a comparable level of intake and mortality of all forms of marine life as the combination of the standard BMZ and wastewater dilution if wastewater is available, or multiport diffusers if wastewater is unavailable. In addition to the analysis of the effects required by chapter III.M.2.d.(2)(c), the owner or operator must also evaluate the individual and cumulative effects of the alternative BMZ on the intake and mortality of all forms of marine life. In no case may the discharge result in hypoxic conditions outside of the alternative BMZ. If an alternative BMZ is approved, the alternative distance and the areal extent of the alternative BMZ shall be used in lieu of the standard BMZ for all purposes, including establishing an effluent limitation and a receiving water limitation for salinity, in chapter III.M.	Poseidon has submitted studies (See Appendices C, BB, QQ, and VV to the ROWD) demonstrating the BMZ may extend to 200 meters (656 ft.) and that the combination of the alternative BMZ and flow augmentation provides a comparable level of intake and mortality of all forms of marine life as the combination of the standard BMZ and multiport diffusers. Based on this information, the San Diego Water Board determined the BMZ will be 200 meters (656 ft.) in section IV.C.5 of the Fact Sheet, Attachment F to the Order, from the end of the discharge jetties, which is less than the 1000 ft. zone of initial dilution specified in Order No. 2006-0065. The 2006 Order did not specify a BMZ separate from the zone of initial dilution. At that time, the Desalination Amendment, which requires a separate BMZ and zone of initial dilution, had not been adopted yet.
70	3.e	Existing facilities that do not meet the receiving water limitation at the edge of the BMZ and throughout the water column by January 28, 2016 must either: 1) establish a facility-specific alternative receiving water limitation for salinity as described in chapter III.M.3.c; or, 2) upgrade the	Poseidon will meet the receiving water limitation based on the discharge salinity, expected dilution within the BMZ, and natural background salinity concentrations. Attachment E, Monitoring and Reporting Program, to this Order requires salinity monitoring in the receiving waters to

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		facility's brine discharge method in order to meet the receiving water limitation in chapter III.M.3.b in accordance with the State Water Board's Compliance Schedule Policy, as set forth in chapter III.M.3.f below. An owner or operator that chooses to upgrade the facility's method of brine discharge disposal:	verify that the Facility does not exceed the receiving water limitation for salinity. See Finding 69 regarding the appropriateness of establishing a facility-specific receiving water limitation for salinity.
71	3.f	The regional water board may grant compliance schedules for the requirements for brine waste discharges for desalination facilities. All compliance schedules shall be in accordance with the State Water Board's Compliance Schedule Policy, except that the salinity receiving water limitation set forth in chapters III.M.3.b and III.M.3.c. shall be considered to be a "new water quality objective" as used in the Compliance Schedule Policy.	The hydrodynamic dilution model provided by Poseidon in Appendices C, BB, QQ, and VV to the ROWD indicates that the brine discharge is anticipated to meet the receiving water limitation within a 200 meter (656 ft.) BMZ based on the discharge salinity, expected dilution within the BMZ, and natural background salinity concentrations. If the empirical study, required in section VI.C.2.b~~a.i~~ of this Order (see Findings 31-36), comparing discharge mortality from flow augmentation to the marine life mortality from a multiport diffuser demonstrates that additional modifications are needed at the Facility, Poseidon may request a compliance schedule from the San Diego Water Board to implement the needed additional measures.
72	3.g	The regional water board in consultation with the State Water Board staff may require an owner or operator to provide additional studies or information if needed. All studies and models are subject to the approval of the regional water board in consultation with State Water Board staff. The regional water board may require an owner or operator to hire a neutral third-party entity to review studies and models and makes recommendations to the regional water board.	The San Diego Water Board is requiring special studies in section VI.C.2 of this Order. Section VI.B.2 of the Fact Sheet in Attachment F of this Order contains additional information regarding these special studies. The Special Studies include: • Multiport Diffuser Analysis in section VI.C.2.a of this Order • Brine Discharge Technology Emp~~r~~irical Study in section VI.C.2.b~~a~~ of this Order; • Updated Marine Life Mitigation Plan in section VI.C.2.d~~c~~ of this Order; and

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			• Receiving Water Violation Assessment in section VI.C.2.c~~b~~ of this Order.
-	4	**Monitoring and Reporting Program**	
73	4.a	The owner or operator of a desalination facility must submit a Monitoring and Reporting Plan to the regional water board for approval. The Monitoring and Reporting Plan shall include monitoring of effluent and receiving water characteristics and impacts to all forms of marine life. The Monitoring and Reporting Plan shall, at a minimum, include monitoring for benthic community health, aquatic life toxicity, hypoxia, and receiving water characteristics consistent with Appendix III of this Plan and for compliance with the receiving water limitation in chapter III.M.3. Receiving water monitoring for salinity shall be conducted at times when the monitoring locations are most likely affected by the discharge. For new or expanded facilities the following additional requirements apply: (1) An owner or operator must perform facility-specific monitoring to demonstrate compliance with the receiving water limitation for salinity and evaluate the potential effects of the discharge within the water column, bottom sediments, and the benthic communities. Facility specific monitoring is required until the regional water board determines that a regional monitoring program is adequate to ensure compliance with the receiving water limitation. The monitoring and reporting plan shall be reviewed, and revised if necessary, upon NPDES permit renewal. (2) Baseline biological conditions shall be established at the discharge location and at a reference	Order No. R9-2006-0065 established a Monitoring and Reporting Plan. In the ROWD and Appendix Z to the ROWD, Poseidon proposed modifications to the Monitoring and Reporting Plan including changes to the receiving water monitoring and effluent monitoring. In general, the San Diego Water Board has established monitoring requirements in Attachment E, Monitoring and Reporting Program, to this Order that are consistent with Poseidon's request. The Monitoring and Reporting Plan is discussed in detail in section VII of Attachment F of the Order.

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		location prior to commencement of construction. The owner or operator is required to conduct biological surveys (e.g., Before-After Control-Impact study), that will evaluate the differences between biological communities at a reference site and at the discharge location before and after the discharge commences. The regional water board will use the data and results from the surveys and any other applicable data for evaluating and renewing the requirements set forth in a facility's NPDES permit.	

Attachment H.2 - Design Alternatives Analysis Supplement to Attachment H

California Water Code (Water Code) section 13142.5(b) (hereinafter Water Code section 13142.5 (b)) provides: "*For each new or expanded coastal powerplant or other 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*." A "Desalination Facility", as defined by the *Water Quality Control Plan for Ocean Waters of California, California Ocean Plan* (Ocean Plan)[1], is an industrial facility. Any new or expanded desalination facility using seawater is subject to the requirements of Water Code section 13142.5(b) to minimize the intake and mortality of marine life. Water Code section 13142.5(b) requires that new or expanded desalination facilities use the best available site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life.

The Ocean Plan provides specific direction for regional water boards regarding the determination required by Water Code section 13142.5(b) to ensure a consistent statewide approach for minimizing intake and mortality of marine life and protecting water quality and related beneficial uses of ocean waters when permitting new or expanded seawater desalination facilities. The San Diego Water Board's role in making the Water Code section 13142.5(b) determination is to evaluate a range of feasible alternatives separately for each of the following: the best available site, design, technology, and mitigation measures to minimize intake and mortality of all forms of marine life. The San Diego Water Board then must determine the best combination of feasible alternatives to minimize intake and mortality of all forms of marine life. (Ocean Plan chapter III.M.2.a(2).) The purpose of this Attachment H.2 is to supplement Attachment H.1 of the Order with additional information regarding the San Diego Water Board's determination as required by Water Code section 13142.5(b).

Poseidon Resources (Channelside) LP (Poseidon or Discharger) provided information to the San Diego Water Board for the evaluation of 21 different intake and outfall design combinations, referred to as Design Alternatives, in Poseidon's report of waste discharge (ROWD) and appendices in application for this Order establishing waste discharge requirements for permanently operating the Carlsbad Desalination Plant (CDP or Facility) as a stand-alone Facility. Table H.2-1 below provides an overview of the 21 Design Alternatives.

Table H.2-1: Overview of Intake and Outfall Design Alternatives

Design Alternative	Intake Design Description	Outfall Design Description	ROWD Appendix
1	Onshore Traveling Screens with Fish Return System	Flow Augmentation[2]	B
2	Onshore Traveling Screens with Fish Return System	Multiport Diffuser[3]	B
3	In Lagoon with Subsurface Intake Galleries	Flow Augmentation	B

[1] The Ocean Plan defines "desalination facility" as an industrial facility that processes water to remove salts and other components from the source water to produce water that is less saline than the source water.

[2] Flow Augmentation is defined in Attachment A of the Order as "A type of in-plant dilution that occurs when a desalination facility withdraws additional source water for the specific purpose of diluting brine prior to discharge."

[3] Multiport Diffusers are defined in Attachment A of the Order as "Linear structures consisting of spaced ports or nozzles that are installed on submerged marine outfalls and enable rapid mixing, dispersal, and dilution of brine within a relatively small area."

Design Alternative	Intake Design Description	Outfall Design Description	ROWD Appendix
4	In Lagoon with Subsurface Intake Galleries	Multiport Diffuser	B
5	In Ocean with Wedgewire Screens (WWS)	Flow Augmentation	II
6	In Ocean with WWS	Multiport Diffuser	II
7	In Lagoon with WWS	Flow Augmentation	II
8	In Lagoon with WWS	Multiport Diffuser	II
9	In Lagoon with Traveling Screens at the Shoreline	Flow Augmentation	II
10	In Lagoon with Traveling Screens at the Shoreline	Multiport Diffuser	II
11	In Lagoon with Traveling Screens at the Shoreline	Flow Augmentation	CCC
12	In Lagoon with Traveling Screens at the Shoreline	Flow Augmentation	CCC
13	In Lagoon with Traveling Screens at the Shoreline	Flow Augmentation	CCC
14	In Lagoon with Traveling Screens at the Shoreline	Flow Augmentation	CCC
15	Onshore Traveling Screens with Fish Return System	Flow Augmentation	BBB
16	Onshore Traveling Screens with Fish Return System	Flow Augmentation	BBB
17	Onshore Traveling Screens with Fish Return System	Flow Augmentation	BBB
18	Onshore Traveling Screens with Fish Return System	Flow Augmentation	BBB
19	Onshore Traveling Screens with Fish Return System	Flow Augmentation	BBB
20	Onshore Traveling Screens with Fish Return System	Flow Augmentation	BBB
21	In Lagoon with WWS	Flow Augmentation	DDD and EEE

Based on the information provided by Poseidon and as explained below, the San Diego Water Board has determined that Design Alternative 21 provides the best available site, design, technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life while considering construction, operation, and maintenance costs. Design Alternative 21 proposes to retain the existing discharge configuration that conveys flow augmentation water to the dilution pond and then through the surface channel to the Pacific Ocean.

Design Alternative 21 also proposes to modify the existing intake configuration by installing 16 submerged WWS in the outer embayment of Agua Hedionda Lagoon at a sufficient distance offshore to benefit from currents caused by tidal action. The WWS may include rotating brushes and/or an air burst system to remove marine debris, such as vegetation or marine life, that accumulates on the screens, thereby maintaining sufficient intake flow capacity to operate the Facility. The WWS will be connected to the shoreline by four intake pipelines, called laterals, on the seafloor of Agua Hedionda Lagoon. The laterals will be buried and covered with natural materials to restore the seafloor habitat to pre-project conditions.

Moreover, Design Alternative 21 may require less acreage of maintenance dredging in Agua Hedionda Lagoon because the channel from the WWS to the shoreline may no longer require dredging. Currently, the seafloor of Agua Hedionda Lagoon is currently dredged approximately once every three years to maintain intake flow capacity for the Encina Power Station (EPS). Although this maintenance dredging will continue in the future to maintain intake flow capacity for Poseidon's Facility, the dredging footprint may be reduced. Periodic suction dredging may be required around the screens to remove accumulated debris.

Further, the use of WWS in the Lagoon at the point of water withdrawal will minimize marine life impacts by avoiding entrapment of marine life within the intake laterals, reducing impingement of marine life to *de minimis* levels, and minimizing entrainment of marine life by maintaining a through-screen velocity of less than 0.5 ft/sec in accordance with Ocean Plan requirements. This Attachment details the San Diego Water Board's determination regarding the evaluation of the 21 Design Alternatives listed in Table H.2-1.

Site

The Ocean Plan at chapter III.M.2.b requires Poseidon to evaluate a reasonable range of nearby sites, including sites that would likely support subsurface intakes. As set forth in Attachment H.1, Findings 9 through 15, the San Diego Water Board has evaluated the Design Alternatives for conformance with the Ocean Plan criteria and has determined that Design Alternative 21 provides the best available site feasible to minimize the intake and mortality of all forms of marine life.

Design

The Ocean Plan at chapter III.M.2.c requires Poseidon to perform several analyses to determine whether a proposed design is the best available design feasible to minimize intake and mortality of all forms of marine life. As set forth in Attachment H.1, Findings 16 through 20, the San Diego Water Board has evaluated the Design Alternatives for conformance with the Ocean Plan criteria and has determined that Design Alternative 21 provides the best available design feasible to minimize the intake and mortality of all forms of marine life.

Technology

The Ocean Plan at chapter III.M.2.d specifies several considerations in determining whether a proposed technology is the best available technology feasible to minimize intake and mortality of all forms of marine life. Findings 21 through 37 of Attachment H.1 describe the San Diego Water Board evaluation of the Design Alternatives for conformance with the Ocean Plan criteria. The San Diego Water Board concludes that based on available information, Design Alternative 21 provides the best available technology feasible to minimize the intake and mortality of all forms of marine life.

Intake Technology

The Ocean Plan requires an evaluation of intake technology to determine the best available technology feasible to minimize the intake and mortality of all forms of marine life.

Subsurface Intakes

The Ocean Plan requires that the San Diego Water Board consider subsurface intakes in its evaluation of the best available site, design, and technology feasible to minimize the intake and mortality of all forms of marine life. As described in Attachment H.1, Findings 9, 13, 17, 21, 22, and 23, the San Diego Water Board determines that subsurface intakes are infeasible for the reasons stated therein. This determination is consistent with previous findings in this regard in Order No. R9-2009-0038.[4]

Surface Water Intakes

The Ocean Plan chapter III.M.2.d.(1)(c) provides in relevant part that if subsurface intakes are not feasible the San Diego Water Board may approve surface water intakes when the following conditions are met:

[4] Order No. 2009-0038, *Amending Order No. R9-2006-0065 (NPDES No. CA0109223) Waste Discharge Requirements for the Poseidon Resources Corporation, Carlsbad Desalination Project Discharge to the Pacific Ocean Via the Encina Power Station Discharge Channel*, adopted by the San Diego Water Board on May 9, 2009, available at: https://www.waterboards.ca.gov/sandiego/board_decisions/adopted_orders/2009/R9-2009-0038.pdf

"(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 mm (0.04 in) 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)."

Surface water intakes withdraw from water above the seafloor. The withdrawal of seawater for desalination can result in the impingement[5], entrainment[6], and entrapment[7] of marine life. To preclude as much debris, seaweed, fish, and other organisms as possible from entering a desalination facility, the Ocean Plan requires in chapter III.M.2.d.(1)(c)(i), referenced above, that surface water intake structures be screened and that the screens must be functional while the facility is withdrawing seawater. To adequately minimize entrainment impacts, the Ocean Plan requires in chapter III.M.2.d.(1)(c)(ii) referenced above that surface water intakes implement screening technologies with a 1.0 mm or smaller slot size, as that slot size has been demonstrated to be effective in entrainment reduction and protection of eggs, larvae, and juvenile organisms while still being feasible from an operational and maintenance standpoint. In addition, the velocity at which seawater is withdrawn through an intake has a significant influence on the potential for impingement because a higher intake velocity results in greater net force towards the intake that marine life cannot escape. To reduce impingement mortality the Ocean Plan requires in chapter III.M.2.d.(1)(c)(iv) referenced above that surface water intake structures be designed to limit the through-screen intake flow velocity to a maximum of 0.15 m/s (0.5 ft/s).

Water Code section 13142.5(b) requires among other factors that new or expanded desalination facilities use the best available site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life. A reasonable reading of the requirements of Ocean Plan chapter III.M.2.d.(1)(c) indicates that a conduit drawing seawater from a water body should screen the intake at the onset of seawater withdrawal to most effectively minimize intake and mortality of all forms of marine life.

Based on this evaluation, the San Diego Water Board determined that locating the intake screens at the onset of withdrawal from the source waterbody will most effectively minimize the intake and mortality of all forms of marine life because:

1. Siting the intake screen at the onset of the intake ensures that the maximum velocity encountered by organisms entering the intake is 0.5 feet per second, which has been found to protect most small fish and preclude impingement of most large fish that are too large to pass through the intake screens.

[5] Impingement occurs when the flow of water drawn into the facility traps organisms against the intake screens.

[6] Entrainment occurs when organisms are drawn in with the source water and are transported into the facility's system.

[7] Entrapment occurs when organisms enter an intake and do not exit the intake due to factors including but not limited to: the intake velocity, and the types of marine life organisms that may be unable or unwilling to exit interior pipelines and embayments.

2. Siting the intake screen at the onset of the intake eliminates the potential for organism entrapment in the intake structure and thereby precludes entrapment impacts.
3. Siting the intake screen at the onset of the intake precludes the need for a fish return system to transport collected organisms back to Agua Hedionda Lagoon. Fish could be adversely affected by traveling through a fish return system, potentially becoming injured and/or disoriented. Upon exiting the fish return system, damaged or disoriented fish may be unable to escape predators in the Lagoon leading to higher than typical predation rates.

For these reasons, the San Diego Water Board has determined that the use of intake screens at the onset of the intake water structure is the best available intake technology feasible to minimize intake and mortality of all forms of marine life. Of the 21 Design Alternatives proposed by Poseidon in applying for the Water Code section 13142.5(b) determination included as part of this Order, only 12 of the Design Alternatives (Design Alternatives 3 through 14 and 21) meet the Ocean Plan's criteria for 0.5 ft/sec intake velocity when applied at the onset of the intake.

While locating the screens at the onset of the intake water structure will minimize intake and mortality of all forms of marine life, Ocean Plan chapter III.M.2.d.(1)(c) does not explicitly require intake screens to be placed at the onset of the intake. Accordingly, the San Diego Water Board has included other intake alternatives proposed by Poseidon which do not employ screening technology at the onset of the intake, in its evaluation of a range of feasible alternatives for the best available site, design, technology, and mitigation measures to minimize intake and mortality of all forms of marine life. Due to site constraints, the other intake alternatives proposed by Poseidon involve various configurations that rely on a combination of screening technology with placement of the intake screens located downstream of the onset of the intake at the existing EPS trash racks.

The following table, Table H.2-2, summarizes the feasibility[8] and technical factors of the Design Alternatives considered in the San Diego Water Board's analysis for conformance to Ocean Plan chapter III.M.2.d.(1)(c) requirements.

Table H.2-2: Intake Design Alternatives Ocean Plan Chapter III.M.2 Factors

Design Alternative	Intake Design Description	Intake Screen Location	Screen Size	Max Intake Velocity	Through-Screen Velocity	Feasible
1, 2	Traveling Screens	Onshore	3 ½ inch trash rack to 1 mm onshore screens	2.63 ft/sec	0.5 ft/sec	Yes
3, 4	Subsurface Intake Galleries	None	None	NA	0.5 ft/sec	No
5, 6	WWS	Offshore in the Pacific Ocean	1 mm	0.5 ft/sec	0.5 ft/sec	No
7, 8	WWS	Nearshore in the Lagoon	1 mm	0.5 ft/sec	0.5 ft/sec	Yes

[8] The Ocean Plan defines "Feasible" for the purposes of chapter III.M and the determination required by Water Code section 13142.5(b), to mean capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.

Design Alternative	Intake Design Description	Intake Screen Location	Screen Size	Max Intake Velocity	Through-Screen Velocity	Feasible
9, 10	Traveling Screens	Lagoon shoreline	1 mm	0.5 ft/sec	0.5 ft/sec	Yes
11, 12, 13, 14	Traveling Screens	Lagoon shoreline	1 mm	0.5 ft/sec	0.5 ft/sec	No
15	Traveling Screens	Onshore	3 ½ inch trash rack to 1 mm onshore screens	1.54 ft/sec	0.5 ft/sec	Yes
16	Traveling Screens	Onshore	3 ½ inch trash rack to 1 mm onshore screens	2.63 ft/sec	0.5 ft/sec	Yes
17	Traveling Screens	Onshore	3 ½ inch trash rack to 1 mm onshore screens	1.54 ft/sec	0.5 ft/sec	Yes
18	Traveling Screens	Onshore	3 ½ inch trash rack to 1 mm onshore screens	1.04 ft/sec	0.5 ft/sec	Yes
19	Traveling Screens	Onshore	3 ½ inch trash rack to 1 mm onshore screens	1.06 ft/sec	0.5 ft/sec	Yes
20	Traveling Screens	Onshore	3 ½ inch trash rack to 1 mm onshore screens	1.06 ft/sec	0.5 ft/sec	Yes
21	WWS	Offshore in the Lagoon	1 mm	0.5 ft/sec	0.5 ft/sec	Yes

Outfall Technology

Desalination facilities produce brine as a waste stream of the reverse-osmosis process. The discharge technology alternatives in the Ocean Plan for discharging the brine wastewater from desalination facilities include commingling the brine with wastewater in an existing ocean outfall, discharging the brine through a dedicated ocean outfall that terminates in a multiport diffuser, or diluting the brine with additional source water prior to discharging it to the ocean (a process known as flow augmentation).

Poseidon explored the possibility of commingling the brine waste from the Facility with wastewater in the Encina Wastewater Authority's existing Encina Ocean Outfall and other nearby facilities and found that the outfall is near full capacity during large storm events and that future wastewater recycling will reduce the availability of wastewater for brine dilution. Accordingly, the San Diego Water Board has determined that commingling the brine discharge with wastewater is not feasible at this time. See Appendix CC to the ROWD and Attachment H.1 Finding 14, of this Order for additional information.

Poseidon explored the possibility of constructing a dedicated ocean outfall with a multiport diffuser and found that multiport diffusers are infeasible due to costs. Poseidon estimated the cost for constructing a dedicated ocean outfall with a multiport diffuser to be approximately $300 million. Poseidon estimated the cost to operate a dedicated outfall with a multiport diffuser to be approximately $1.2 million/year. ~~Accordingly, the San Diego Water Board has determined that a multiport diffuser is not feasible.~~ See Appendices B, N, X II, and OO to the ROWD and Attachment H.1, Finding 30 of this Order for additional information.

Poseidon explored the possibility of diluting the brine with additional source water, i.e. flow augmentation, prior to discharging it to the ocean and found that flow augmentation provides a comparable level of intake and mortality of all forms of marine life as a multiport diffuser, if wastewater dilution is unavailable. See Appendices A, K, WW, Z, FFF, and GGG to the ROWD and Attachment H-1 Finding 31, of this Order for additional information. As discussed in the Order at Finding II.D and in Attachment H.1 at Finding 31, the San Diego Water Board used the entrainment flow volumes to compare the estimated intake and mortality of both flow augmentation and a theoretical multiport diffuser to conditionally conclude that intake and mortality of all forms of marine life from the two discharge technologies are comparable. Poseidon does not agree that using flow volumes as the basis for the comparative analysis is appropriate and requests that the comparison be based on ETM/APF analyses. However, the ETM/APF analyses provided by Poseidon and available to estimate the intake and mortality of all forms of marine life from a theoretical multiport diffuser lack sufficient data to support a scientifically defensible ETM/APF analysis for a theoretical multiport diffuser. Accordingly, this Order at section VI.C.2.a requires Poseidon to complete a Multiport Diffuser Analysis within the first two years from the permit's effective date to collect marine life data from the open ocean coastal area for use in the ETM/APF calculations for a theoretical multiport diffuser. This data collection is expected to provide greater confidence in the scientific basis for the estimating intake and mortality of all forms of marine life from a theoretical multiport diffuser for purposes of comparison to flow augmentation as required by the Ocean Plan chapter III.M.2.d.(2)(c) and III.M.2.d.(2)(c)v. The Water Code determination is made conditional in limited part on the outcome of this confirmatory study, as discussed in the Order at Finding II.D and in Attachment H.1 at Finding 31.

The existing CDP meets the requirements in chapter III.M.2.d.(2)(d)ii of the Ocean Plan, which specifies the following conditions under which a regional water board may approve of a seawater desalination facility that uses flow augmentation discharge technology:

> *Flow Augmentation as an alternative brine discharge technology is prohibited with the following exception(s):*
>
> *At a facility that has received a conditional Water Code section 13142.5(b) determination and is over 80 percent constructed by January 28, 2016. If the owner or operator of the facility proposes to use flow augmentation as an alternative brine discharge technology, the facility must: use low turbulence intakes (e.g., screw centrifugal pumps or axial flow pumps) and conveyance pipes; convey and mix dilution water in a manner that limits thermal stress, osmotic stress, turbulent shear stress, and other factors that could cause intake and mortality of all forms of marine life; comply with chapter III.M.2.d(1); and not discharge through multiport diffusers*."

For these reasons, the San Diego Water Board has determined, based on available information that flow augmentation and multiport diffusers provide comparable levels of intake and mortality to all forms of marine for purposes of Ocean Plan chapter III.M.2.d.(2)(c). However, as described in the Order at Finding II.D and in Finding 31 of Attachment H.1, the Water Code determination is made conditional in limited part on the outcome of the Multiport Diffuser Analysis required to be completed within two years of the effective date of this Order to provide additional data to confirm this comparability conclusion. ~~is the best available discharge technology feasible to minimize intake and mortality of all forms of marine life~~.

The following table, Table H.2-3, summarizes the feasibility of Design Alternatives considered in this analysis based on discharge design considerations.

Table H.2-3: Feasibility Based on Discharge Design

Design Alternative	Discharge Design Description	Feasible?
None	Commingling with Wastewater	No
2, 4, 6, 8, 10	Multiport Diffuser	No
1, 3, 5, 7, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21	Flow Augmentation	Yes

Mitigation

The Ocean Plan requires Poseidon to fully mitigate for marine life or habitat impacts attributable to the construction and operation of the CDP for the lifetime of the CDP. Poseidon must use the best available mitigation measures feasible to minimize intake and mortality of all forms of marine life. For purposes of determining whether a facility will use the best available mitigation measures feasible, the Ocean Plan requires that the San Diego Water Board evaluate the estimated marine life mortality impacts associated with construction and operation of Facility.

Marine Life Mortality

The Ocean Plan requires at chapter III.M.2.e(1):

> *"Marine Life Mortality Report. The owner or operator of a facility shall submit a report to the regional water board estimating the marine life mortality resulting from construction and operation of the facility after implementation of the facility's required site, design, and technology measures."*

Water Code section 13142.5(b) requires the following:

> *For each new or expanded coastal power plant or other 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.*

Stress, injury, or mortality to marine life from the intake of seawater may result from entrainment, impingement, entrapment, increased predation[9], transportation through a fish return system, and impacts to habitat. The ROWD and appendices submitted to and evaluated by the San Diego Water Board include the information constituting the Marine Life Mortality Report required by the Ocean Plan in chapter III.M.2.e.(1).

Entrainment

Entrainment, as defined by the *Final Staff Report Including the Final Substitute Environmental Documentation*[10] for the Desalination Amendment to the Ocean Plan, occurs when marine

[9] Increased predation of marine life occurs due to the marine life being injured or disoriented while traveling through the intake and fish return system. A fish return system discharges marine life into the lagoon at a single point source that focuses the marine life exiting at that single discharge point. Predator species, including mammals, fish, and birds, can then more easily feed at a single point source on the injured and disoriented sea life that otherwise would be able to escape predation.

[10] The State Water Board's *Final Staff Report Including the Final Substitute Environmental Documentation* for the Desalination Amendment to the Ocean Plan is available on the State Water Board's website (as of August 31, 2018) at:

organisms are drawn in with the source water and transported into a facility's industrial processes. Marine organisms do not survive entrainment due to "*shearing and compressive forces within pumps, exposure to high pressures, and temperature variants during processing, and osmotic shock from exposure to significantly higher salinities during processing and discharge.*" Generally, eggs, larvae, and plankton are small enough to pass through the 1.0 mm screens and experience entrainment mortality.

All of the surface water intake design alternatives considered in this analysis include 1.0 mm intake screens in accordance with the Ocean Plan chapter III.M.2.d.(1)(c)ii requirements. The only difference among the design alternatives that could affect the amount of marine life that are entrained is the volume of intake water required by each Design Alternative.

Impingement

Impingement occurs when marine organisms are trapped on a screen surface because they are unable to escape the intake velocity. Mortality from impingement is possible with screened surface intakes. With subsurface intakes, sand acts as a natural barrier, eliminating impingement. Higher intake velocities result in greater net force towards the intake, increasing the potential for impingement because fewer organisms will successfully swim away from the intake and may become trapped against the intake screens.

Entrapment

The Ocean Plan does not define entrapment. U.S. Environmental Protection Agency (USEPA) defines entrapment for cooling water intakes at power plants in 40 CFR section 125.92[11] as follows:

> *"Entrapment means the condition where impingeable fish and shellfish lack the means to escape the cooling water intake. Entrapment includes but is not limited to: Organisms caught in the bucket of a traveling screen and unable to reach a fish return; organisms caught in the forebay of a cooling water intake system without any means of being returned to the source waterbody without experiencing mortality; or cooling water intake systems where the velocities in the intake pipes or in any channels leading to the forebay prevent organisms from being able to return to the source waterbody through the intake pipe or channel."*

While Clean Water Act section 316(b) and implementing regulations at 40 CFR part 125, subpart J specifically apply to cooling water intakes for power plants, USEPA has not promulgated regulations regarding desalination plant intakes. A report on intake velocities of cooling water intake structures by the Electric Power Research Institute[12] lists screenwall

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https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/rs2015_0033_sr_apx.pdf

[11] See 40 CFR Part 125, Subpart J, Requirements Applicable to Cooling Water Intake Structures for Existing Facilities Under Section 316(b) of the Clean Water Act, Section 125.92, Special Definitions at this website (as of August 21, 2018) https://www.gpo.gov/fdsys/pkg/CFR-2011-title40-vol22/pdf/CFR-2011-title40-vol22-part125.pdf

[12] Page 2-1 of the Electric Power Research Institute report*, Technical Evaluation of the Utility of Intake Approach Velocity as an Indicator of Potential Adverse Environmental Impact under Clean Water Act Section 316(b), Final Report December 2000,* is available on the San Diego Water Board website (as of August 31, 2018) at: https://www.waterboards.ca.gov/rwqcb9/press_room/announcements/carlsbad_desalination/updates_3_13_09/item_116_tab_k.pdf

entrapment areas on the route leading to intake screens as one of the intake design features that contributes to high impingement rates. Reducing entrapment is consistent with the provisions of Water Code section 13142.5(b) because reduced entrapment is expected to minimize intake and mortality of all forms of marine life.

Onshore traveling screen design alternatives (Design Alternatives 1, 15, 16, 17, 18, 19, 20) are the only design alternatives considered in this analysis that present risks of entrapment to marine life. Marine life may pass through the trash rack and enter the intake tunnels, creating a zone of entrapment where marine life may be unable to escape the higher flow velocities at the trash rack (with flow rates that are up to 1.06 feet per second) and within the intake tunnels (with flow rates that are up to 2.6 feet per second). Additionally, the higher flow velocities and unnatural environment within the intake tunnels may stress and disorient entrapped organisms, which could lead to marine life injury, mortality, and higher impingement.

Fish Return System

Only the onshore traveling screen design alternatives (Design Alternatives 1, 15, 16, 17, 18, 19, 20) considered in this analysis present risks of mortality to marine life associated with a fish return system. The fish return system associated with the onshore traveling screen designs is intended to provide a means of egress for some of the impinged or entrapped organisms. However, organisms may suffer exhaustion, suffocation, acute or chronic stress and associated deleterious physiological effects (e.g., impaired growth, immune, and reproductive functions), or delayed mortality as they pass through the fish return system. Locating screens at the onset of the intake precludes the possibility of entrapping organisms in the area between the trash rack and the screens situated farther downstream, thereby minimizing intake and mortality of marine life.

Appendix YY to the ROWD includes estimates of marine life mortality from a fish return system that are based on an Electric Power Research Institute 2010[13] study and a 1989 study at San Onofre Nuclear Generating Station (SONGS). Survival rates from both studies varied with fish species and corresponding swim speeds and ranged from 70 percent to 100 percent for fish greater than 11 mm (0.43 inches) in length. The survival rates from these studies have a small degree of uncertainty because the study conditions were not the same as the onshore traveling screen designs analyzed for this determination. The Science Advisory Panel[14] (SAP) recognized that limited information and uncertainty hinders assessing the effectiveness of a fish return system.

The onshore traveling screen design alternatives with a fish return system can change marine life behavior, leading to increased predation and marine life mortality. Entrapment in the intake tunnels may attract predators, which may feed on confused, injured, and/or trapped marine life – a phenomenon previously observed at SONGS. Additionally, fish return systems are generally designed so that marine organisms exiting the system are discharged at a single point. Predators may congregate at this discharge point to feed on marine life exiting the fish return

[13] The Electric Power Research Institute's December 2010 Report, "*Evaluation of Factors Affecting Juvenile and Larval Fish Survival in Fish Return Systems at Cooling Water Intakes"* is available on the San Diego Water Board's website at: https://www.waterboards.ca.gov/rwqcb9/water_issues/programs/regulatory/docs/2010_EPRI_Fish_Survival.pdf (as of August 31, 2018)

[14] The SAP's final report with recommendations, dated September 15, 2018 is available on the San Diego Water Board's website at: https://www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/docs/SAP/Poseidon_Carlsbad_SAP_report.pdf (as of August 31, 2018)

system. Marine life may be confused and/or injured from passing through the fish return system, making them more susceptible to predation.

Habitat Impacts

The Ocean Plan at chapter III.M.2(b)3 requires that new intake, discharge and other facility infrastructure be sited in a location that avoids impacts to sensitive habitats and sensitive species. Construction of a new intake structure can cause permanent and temporary impacts to marine life habitat within the source water body. The magnitude of impacts to habitat and the types of affected habitat vary by intake design.

Appendix EEE to the ROWD estimates the permanent construction-related habitat impacts for Design Alternative 21 to be 0.2 acres of lagoon habitat consisting of the footprint of the screening structure. In addition to the permanent impacts to habitat from the footprint of Design Alternative 21, temporary impacts to habitat will occur from construction of the intake lateral pipelines from the screens to the shoreline. These temporary impacts can be offset by covering the intake lateral pipelines, following construction, with natural sand or sediment to restore the impacted benthic habitat to pre-project conditions. Furthermore, Design Alternative 21 may reduce the area within Agua Hedionda Lagoon that requires routine maintenance dredging, thus decreasing benthic habitat impacts associated with continued dredging of the Lagoon. The current intake system requires periodic dredging approximately once every three years to remove sediment and sand blocking waterflow in the channel between the mouth of Agua Hedionda Lagoon to the intake at the shoreline on the south side of the Lagoon. Design Alternative 21 would place the intake approximately 800 feet offshore in the Lagoon. Dredging may no longer be needed in the 800 linear feet between the WWS and the south shoreline where the current intake is located. Design Alternative 21 may require spot suction dredging around the screens to remove accumulated debris and occasionally to keep the mouth of the lagoon open for water flow.

Marine Life Impacts of Design Alternatives

Table H.2-4 summarizes the potential marine life impacts due to construction and operation of different intake designs and provides a comparison of the potential impacts to marine life caused by the different design alternatives. The subsurface intake Design Alternatives 3 and 4 are projected have the lowest overall impacts to marine life. Of the surface water intake design alternatives, those alternatives with the 1-mm screens placed directly at the interface with the Lagoon have the lowest projected marine life impacts, such as Design Alternatives 9 through 14 and 21.

Table H.2-4: Marine Life Impacts by Intake Design Alternatives

Design Alternative	Intake Design Description	Maximum Intake Velocity[1]	Entrainment Impacts[2]	Impingement Impacts[2]	Entrapment Impacts[3]	Habitat Impacts
1 Appendix ZZ of ROWD	Onshore Traveling Screens with Fish Return	2.63 ft/sec	83.44 acres	0	0.85 to 0.93 acres	0.1 acres
2 Appendix ZZ of ROWD	Onshore Traveling Screens with Fish Return	2.63 ft/sec	83.44 acres	0	0.85 to 0.93 acres	0.1 acres
3 Appendix II of ROWD	Lagoon Subsurface Intake Galleries	NA	0	0	0	72 acres

Design Alternative	Intake Design Description	Maximum Intake Velocity[1]	Entrainment Impacts[2]	Impingement Impacts[2]	Entrapment Impacts[3]	Habitat Impacts
4 Appendix II of ROWD	Lagoon Subsurface Intake Galleries	NA	0	0	0	72 acres
5 Appendix II of ROWD	Offshore Ocean WWS	0.5 ft/sec	92 acres	0	0	2.0 acres
6 Appendix II of ROWD	Offshore Ocean WWS	0.5 ft/sec	92 acres	0	0	2.0 acres
7 Appendix EEE of ROWD	Offshore Lagoon WWS	0.5 ft/sec	83.44 acres	0	0	0.2 acres
8 Appendix EEE of ROWD	Offshore Lagoon WWS	0.5 ft/sec	83.44 acres	0	0	0.2 acres
9 Appendix II of ROWD	Lagoon Traveling Screens at the Shoreline	0.5 ft/sec	83.44 acres	0	0	0.19 acres
10 Appendix II of ROWD	Lagoon Traveling Screens at the Shoreline	0.5 ft/sec	83.44 acres	0	0	0.19 acres
11 Appendix II of ROWD	Lagoon Traveling Screens at the Shoreline	0.5 ft/sec	83.44 acres	0	0	0.19 acres
12 Appendix II of ROWD	Lagoon Traveling Screens at the Shoreline	0.5 ft/sec	83.44 acres	0	0	0.19 acres
13 Appendix II of ROWD	Lagoon Traveling Screens at the Shoreline	0.5 ft/sec	83.44 acres	0	0	0.19 acres
14 Appendix II of ROWD	Lagoon Traveling Screens at the Shoreline	0.5 ft/sec	83.44 acres	0	0	0.19 acres
15 Appendix ZZ of ROWD	Onshore Traveling Screens with Fish Return	1.54 ft/sec	83.44 acres	0	0.85 to 0.93 acres	0.1 acres
16 Appendix ZZ of ROWD	Onshore Traveling Screens with Fish Return	2.63 ft/sec	83.44 acres	0	0.85 to 0.93 acres	0.1 acres

Design Alternative	Intake Design Description	Maximum Intake Velocity[1]	Entrainment Impacts[2]	Impingement Impacts[2]	Entrapment Impacts[3]	Habitat Impacts
17 Appendix ZZ of ROWD	Onshore Traveling Screens with Fish Return	1.54 ft/sec	83.44 acres	0	0.85 to 0.93 acres	0.1 acres
18 Appendix ZZ of ROWD	Onshore Traveling Screens with Fish Return	1.04 ft/sec	83.44 acres	0	0.85 to 0.93 acres	0.1 acres
19 Appendix ZZ of ROWD	Onshore Traveling Screens with Fish Return	1.06 ft/sec	83.44 acres	0	0.85 to 0.93 acres	0.1 acres
20 Appendix ZZ of ROWD	Onshore Traveling Screens with Fish Return	1.06 ft/sec	83.44 acres	0	0.85 to 0.93 acres	0.1 acres
21 Appendix EEE of ROWD	Offshore Lagoon WWS	0.5 ft/sec	83.44 acres	0	0	0.2 acres

[1]All of the surface water intake alternatives will have a through-screen intake velocity of 0.5 ft/sec. However, some of the alternatives are projected to have a higher intake velocity in the pipes leading to the 1-mm screens. The increased velocity in the tunnels prior to the fish screens being onshore would increase the risk of entrapment of marine life within the tunnels.

[2]Measured in acres of area production foregone. Area production forgone (APF) also known as habitat production foregone, is defined in the Ocean Plan and refers to an estimate of the area that is required to produce (replace) the same amount of larvae or propagules that are removed via entrainment at a desalination facility's intakes. APF is calculated by multiplying the proportional mortality by the source water body, which are both determined using an empirical transport model.

[3]Entrapment impacts include potential impacts due to a fish return system.

Economic Considerations of Design Alternatives

Cost and economics are principal factors in evaluating an alternative's feasibility[15]. Poseidon has submitted information to the San Diego Water Board for analysis including "fixed capital and operating costs not recovered while the Facility is out of service after 2018" with an "out-of-service" cost ranging from $200 million to $423 million. Some of the Design Alternatives that Poseidon proposed for the San Diego Water Board's analysis would require the Facility to shut down drinking water production for an extended period while a new intake structure is constructed. For many of the alternatives, a shutdown of the Facility may be avoided through the compliance schedule in the Order at section VI.C.7, which allows interim intake facilities or temporary continued use of the existing pumps while construction of the new pumps and intake

[15] Feasible is defined by the Ocean Plan as capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors. Economics is also a societal and governmental concern in determining feasibility.

structure is completed. Some alternatives such as Design Alternatives 9 and 10 could not avoid an extended plant shutdown because the new intake structure would be constructed at the existing intake. Other alternatives such as Design Alternatives 3 and 4 would require a compliance schedule longer than the minimum five years required by the Ocean Plan. The cost evaluation presented below does not include the "out-of-service" cost information for those alternatives that would require a Facility shutdown to construct.

Table H.2-5 below summarizes the estimated costs and construction timeframe for each intake design alternative. When evaluating the cost of construction and operation of the new intake design, the San Diego Water Board is not required to select the least expensive alternative. "*The fact that an alternative may be more expensive or less profitable is not sufficient to show that the alternative is financially infeasible. What is required is evidence that the additional costs or lost profitability are sufficiently severe as to render it impractical to proceed with the project.*" (Cf., SPRAWLDEF v. San Francisco Bay Conservation and Development Commission (2014) 226 Cal.App.4th 905, 918, applying an analysis of project alternative feasibility pursuant to CEQA.).

Poseidon and the San Diego County Water Authority (SDCWA) have previously expressed a preference for Design Alternatives 1 and 15; while the San Diego Water Board prefers Design Alternative 21. Design Alternatives 1, 15, and 21 can be constructed while avoiding a long-term shutdown of plant operations and the costs associated with a plant shutdown.

Table H.2-5: Cost Estimates by Intake Design[16]

Design Alternative	Intake Design Description	ROWD Appendix Source	Construction Capital Cost (Million $)	Annual O&M Cost (Million $/Year)	Construction Time (Years)
1	Onshore Traveling Screens with Fish Return with Flow Augmentation	EEE	$68.1 mill	$4.8 mill/year	2.1 years
2	Onshore Traveling Screens with Fish Return with Diffuser	OO	$428.6 mill	$2.2 mill/year	6 years
3	Lagoon Subsurface Intake Galleries with Flow Augmentation	OO	$1,037.7 mill	$10.1 mill/year	10.2 years
4	Lagoon Subsurface Intake Galleries with Diffuser	OO	$676.9 mill	$5.2 mill/year	6.8 years
5	Offshore Ocean WWS with Flow Augmentation	OO	$285.5 mill	$3.9 mill/year	6 years
6	Offshore Ocean WWS with Diffuser	OO	$76.8 mill	$2.3 mill/year	6 years
7	Offshore Lagoon WWS with Flow Augmentation	OO	$126.9 mill	$3.8 mill/year	6 years
8	Offshore Lagoon WWS with Diffuser	OO	$405.8 mill	$2.2 mill/year	6 years
9	Lagoon Traveling Screens at the Shoreline with Flow Augmentation	OO	$80.8 mill	$3.8 mill/year	6 years
10	Lagoon Traveling Screens at the Shoreline	OO	$35 mill	$6.7 mill/year	6 years
11	Lagoon Traveling Screens at the Shoreline with Flow Augmentation	CCC	$112.7 mill	$3.25 mill/year	4 years

[16] The information in this table is taken from Appendices II, BBB, CCC, and EEE to the ROWD. Appendix II was submitted in 2016 and was the best available information at that time. Actual costs from Appendix II may have risen since that time.

Design Alternative	Intake Design Description	ROWD Appendix Source	Construction Capital Cost (Million $)	Annual O&M Cost (Million $/Year)	Construction Time (Years)
12	Lagoon Traveling Screens at the Shoreline with Flow Augmentation	CCC	$111.4 mill	$3.25 mill/year	4 years
13	Lagoon Traveling Screens at the Shoreline with Flow Augmentation	CCC	$111.1 mill	$3.25 mill/year	4 years
14	Lagoon Traveling Screens at the Shoreline with Flow Augmentation	CCC	$113.4 mill	$3.25 mill/year	4 years
15	Onshore Traveling Screens with Fish Return with Flow Augmentation	EEE	$71.9 mill	$4.8 mill/year	2.2 years
16	Onshore Traveling Screens with Fish Return with Flow Augmentation	BBB	$47.2 mill	$4.8 mill/year	3.3 years
17	Onshore Traveling Screens with Fish Return with Flow Augmentation	BBB	$50.2 mill	$4.8 mill/year	3.5 years
18	Onshore Traveling Screens with Fish Return with Flow Augmentation	BBB	$56.3 mill	$4.8 mill/year	4 years
19	Onshore Traveling Screens with Fish Return with Flow Augmentation	BBB	$43.6 mill	$4.8 mill/year	2.4 years
20	Onshore Traveling Screens with Fish Return with Flow Augmentation	BBB	$54.3 mill	$4.8 mill/year	2.2 years
21	Offshore Lagoon WWS with Flow Augmentation	September 13, 2018 meeting	$66.1 to 82.8 mill	$5.8 to $6.6 mill/year	5 years

Reliability Considerations

The confidence in the projected reliability of the intake design alternatives varies based on the known constraints and the availability of historical operational data for a design alternative. Intake design alternatives that are similar to the current shoreline intake operation would have a higher confidence for reliability because the engineering parameters for operation and maintenance, such as the required amount of debris cleaning, are established and well understood. Poseidon has indicated that they have the most confidence in the operational reliability of Design Alternatives 1 and 15 because these alternatives are similar to the existing shoreline intake structure. More unknown parameters exist for the other design alternatives that are proposing a change to the design and technology of the existing intake structures. For example, if the same intake technology and configuration for an existing water intake were proposed for application in a different source water body, the data and operational parameters for the existing water intake could provide a basis for increased confidence in the reliability of the intake technology in the different source water body. Intake design alternatives that have not been implemented at any other sites, have a lower confidence of reliability, due to a lack of empirical performance data to assess the reliability of such design alternatives. Although these design alternatives may not have empirical performance data, some parameters for operation and maintenance can be conservatively estimated based on other data sources.

In Appendix DDD of the ROWD, *Feasibility Assessment of Carlsbad Desalination and Intake*

and Discharge Alternative 21, Poseidon raises technical concerns that Alternative 21 has potential reliability issues pertaining to cleaning and debris management that that could impair the operational reliability of the Facility. Poseidon's chief reliability concern with Design Alternative 21 is that the use of narrow-slot WWS in a low-energy estuarine marine environment like Agua Hedionda Lagoon constitutes an operational risk since there are no performance data on such installations as proposed for this alternative. The San Diego Water Board responds to the identified concerns with the reliability of Design Alternative 21 below.

1. *The use of an existing intake technology in an unproven application represents a technical risk to the reliable operation of the CDP.*

   The WWS technology incorporated in Design Alternative 21 has been installed and operated effectively in fresh water and at a small-scale in seawater for decades although not in a lagoon environment. WWS technology has proven to be reliably effective in river and ocean water body settings. Operation of WWS technology in a lagoon environment will have similarities and disparities when compared to other facilities that use WWS technology in the open ocean and in a river. While certain risks exist due to a lack of operational data for implementing WWS in a lagoon, these risks can be mitigated by examining the operation of WWS in other environments and through implementing a pilot scale intake project in the Lagoon to assess debris management and intake maintenance requirements.

2. *The cleaning and maintenance requirements are high due to uncertainty relative to performance of narrow-slot WWS in the Lagoon.*

   Poseidon submitted an estimate of cleaning and maintenance requirements based on the requirements for the existing shoreline surface water intake configuration of the Encina Power Station. The placement of WWS in the Lagoon under Design Alternative 21 will have different operational parameters that might possibly reduce the cleaning and maintenance requirements when compared to the existing shoreline intake structure. For example, the Design Alternative 21 intake flow and through-screen velocity for the WWS (i.e. 299 MGD at 0.5 ft/sec) will be far less than the Encina Power Station intake which averaged 657 MGD with a through – screen velocity of up to 2.9 ft/sec. The greatly reduced intake flow and through-screen velocity for the WWS would potentially result in less clogging debris. The WWS can be installed with self-cleaning brushes to remove clogging debris. Furthermore, the current intake structure is at a dead-end corner of the Lagoon where debris collects and can only be removed through the intake structure. Under Design Alternative 21, the WWS can be located within the interior of the Lagoon where natural sweeping currents and tidal action can keep debris moving away from the screens. The existing shoreline intake structure withdraws water from the entire Lagoon water column, from the water surface to the floor bottom of the Lagoon. Under Design Alternative 21 the WWS will be situated on raised foundations on the Lagoon floor, allowing floating debris to be caught by a floating boom and settling debris to accumulate below the screens. All of these considerations have the potential to significantly reduce the amount of debris on WWS placed in the Lagoon at the point of water withdrawal as compared to the current shoreline intake configuration.

3. *The cleaning of the intake laterals via pigging creates challenges associated with debris management and meeting the terms of the Water Purchase Agreement regarding allowable days offline.*

Due to the marine environment of the pipeline laterals for the Design Alternative 21 intake facilities, a robust cleaning maintenance program of the intake pipelines is anticipated to prevent buildup of biological marine growth that could cause a reduction in water flow to the Facility. Various methods can be used to control marine growth in pipelines such as continued chlorine addition, heat treatment, shock chlorination and pigging. Poseidon has indicated the conceptual design of the intake laterals will be based on the "pigging" maintenance approach. This maintenance approach would use an interior scrubbing device called a "pig" that would be launched through the pipeline. The pig has an abrasive coating that scrubs the pipeline walls, removing any natural buildup of marine sediments, mineral deposits and bio-growth and pushing out the debris. Detailed information is not yet available at this stage of alternative analysis on the frequency of pipeline cleanings, volumes of flush water that would be generated, the characteristics and volumes of debris that would be produced and the method of debris disposal. Silt screens and treatment measures will need to be developed to address the debris management. The intake pipe lateral cleaning may be able to be scheduled sometimes during regular plant maintenance periods when the Facility is already scheduled to be offline. These items and other issues will need to be further investigated by Poseidon and the results incorporated into the final design of the intake structure.

4. *The schedule for permitting, designing, and constructing a structure in the Lagoon will take up to 5 years – longer than alternatives that do not require construction in the Lagoon.*

   Section VI.C. 9 of the Order includes a compliance schedule that would allow interim intake and discharge operations during stand-alone operations to continue for a period of up to five years from the time that EPS ceases power generating activities until the permanent new intake structure and configuration is constructed and operational.

5. *The total environmental impact is greater than other alternatives due to the permanent loss of benthic habitat in the Lagoon.*

   As previously discussed in the "*Habitat Impacts"* section of this Attachment, Poseidon estimates in Appendix EEE of the ROWD that the permanent construction-related benthic habitat impacts for Design Alternative 21 would be 0.2 acres of lagoon habitat. The temporary impacts to benthic habitat from construction of Design Alternative 21 can be partially mitigated by covering the intake lateral pipelines after placement with natural sand or sediment to eventually restore the impacted benthic habitat. Furthermore, Design Alternative 21 may reduce the area within Agua Hedionda Lagoon that requires routine maintenance dredging, thus decreasing benthic habitat impacts associated with continued maintenance dredging of the Lagoon.

6. *The cost is greater than other alternatives due to requisite in-water construction and increased maintenance anticipated.*

   In Appendix EEE of the ROWD, Poseidon presents a Table with a revised assessment of the overall feasibility of Design Alternative 21. The Table compares the environmental impacts, cost, and construction schedule aspects of Design Alternative 21 as compared to Design Alternatives 1 and 15. This Table indicates that Alternative 21 has a reduced total environmental, a comparable cost (capital cost and annual operation and maintenance cost), and a longer construction schedule by approximately two years. The San Diego Water Board has concluded that Design Alternative 21 provides the best

combination of available site, design, technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life based in part on Poseidon's overall feasibility assessment in Appendix EEE of the ROWD.

While Design Alternative 21 represents a substantial change in design and technology from the current intake technology that is currently in place at the Facility, the San Diego Water Board has concluded that the concerns cited by Poseidon affecting the operational reliability of Alternative 21 are not an insurmountable barrier to the construction and reliable implementation of Design Alternative 21 and do not render the alternative infeasible. Chapter III.M.2.a(5)(b) of the Ocean Plan provides that the San Diego Water Board may allow up to five years from the date of an event identified in a previous Water Code section 13142.5(b) conditional determination for the owner or operator to make modifications to the Facility that are required by a new section 13142.5(b) determination. The San Diego Water Board concludes that potential water supply interruptions resulting from the necessary facility modifications require additional time, and a compliance schedule of up to five years is in the public interest and reasonably required for the modifications. In the event that the pilot study identifies necessary changes to Design Alternative 21, a potential future facility design or operation change to address the reliability could constitute a facility expansion within the meaning of the Ocean Plan and provide the basis for a limited new Water Code section 13142.5(b) determination as an expanded facility. See, Ocean Plan Chapter III.M.1.b.(2).

Social Factors

The Ocean Plan defines "feasible" as including consideration of "social factors." Development of seawater desalination in San Diego County assists the region in diversifying its water resources, reducing dependence on imported water supplies, and providing a drought-proof, locally-sourced water supply to help meet the water demand for a growing population and economy. The Facility began operation on December 23, 2015 and can provide a highly reliable local supply of up to 56,000 acre-feet/ year within the SDCWA boundaries which encompasses the western third of San Diego County. Poseidon reports that CDP's expected potable water output can be increased to 60 MGD with appropriate permit modifications. According to the SDCWA's 2015 Urban Water Management Plan[17], this will supply about 29 percent of the local water supply. The San Diego Water Board recognizes the importance and urgency of providing a reliable and continuous water supply to support the San Diego Region's quality of life and to protect public health during a time of declining availability of imported water. Regional initiatives to emphasize water conservation, reuse water through recycling, and desalination provide a drought resistant mix of water supply resources and increase the region's ability to reduce reliance on imported water supplies from outside the region.

As previously discussed, comparing the cost of Poseidon's previously preferred Design Alternatives 1 and 15 to Design Alternative 21 demonstrates that Design Alternative 21 has a comparable construction capital cost at $66.1 to $82.8 million and a projected operation and maintenance cost of $5.8 to $6.6 million per year. If the capital cost is paid off over a 30-year life of the intake structure, the per year cost of Design Alternative 21 including maintenance to consumers served by SDCWA would be between $8.0 to 9.36 million per year. Table H.2-6 provides a summary of the costs only of Design Alternatives 1, 15, and 21 because those are the alternatives preferred by Poseidon, SDCWA, and the San Diego Water Board.

[17] SDCWA's 2015 Urban Water Management Plan is available at this website: https://www.sdcwa.org/urban-water-management-plan (as of June 25, 2018)

Table H.2-6. Comparison Cost of Design Alternatives 1, 15, and 21

Design Alternative	Construction Capital Cost Year	Operation and Maintenance Cost/year	Total Cost per Year
1, App. EEE to the ROWD	$5.9 mill/year	$4.8 mill/year	$10.7 mill/year
15, App. EEE to the ROWD	$6.2 mill/year	$4.8 mill/year	$11.0 mill/year
21, Sept. 13, 2018 meeting	$5.7 to 7.1 mill/year	$5.8 to 6.6 mill/year	$11.5 to 13.7 mill/year

Benefits of seawater desalination come with associated risks and costs. Coastal waters affected by the operation of the CDP constitute a public trust resource held in common for public use and enjoyment, support beneficial uses, and serve vital environmental, social, and economic functions for society. The fundamental mission of the San Diego Water Board under the Porter-Cologne Water Quality Control Act is to protect the beneficial uses of these coastal waters for the benefit of current and future generations. Based on all of these considerations of social factors, Design Alternative 21 provides a reasonable balance of costs while serving the public interest in maximizing marine life protection.

Design Alternative 21 Represents the Best Combination of Feasible Alternatives to Minimize the Intake and Mortality of Marine Life

In making a Water Code section 13142.5(b) determination, the San Diego Water Board must independently evaluate a range of feasible alternatives for the best available site, design, technology, and mitigation measures to minimize intake and mortality of all forms of marine life and then determine the best combination of feasible alternatives to minimize intake and mortality of all forms of marine life (Ocean Plan chapter III.M.2.a(2).) Based on the foregoing analysis of feasible alternatives, the San Diego Water Board has determined that based on available information,[18] Design Alternative 21 provides the best combination of available site, design, technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life while considering construction, operation, and maintenance costs.

[18] As discussed in the Order at Finding II.D and in Attachment H-1 at Finding 31, the Water Code section 13142.5(b) determination is made conditional on the results of the Multiport Diffuser Analysis required to be completed within the first two years following the effective date of the Order confirming that flow augmentation technology is supported by the comparison required in Ocean Plan Chapter III.M.2.d.(2)(c).