APPENDIX 10: OCEAN PLAN AMENDMENT SITING AND INTAKE AND DISCHARGE METHOD CONSIDERATIONS

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1 INTRODUCTION

The California Ocean Plan Amendment (OPA) Section 13142.5(b) requires that ocean desalination projects demonstrate the best available, site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life.[1] In determining the best available site, the owner or operator must evaluate a reasonable range of nearby sites, including sites that would likely support subsurface intakes.[2] "Site" is defined as "the general onshore and offshore location of a new or expanded facility and there may be multiple potential facility design configurations within any given site."[3] The OPA states the following:

"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 Board shall require the owner or operator to:

- Consider whether subsurface intakes are feasible.
- Consider whether the identified need for desalinated water is consistent with an applicable adopted urban water management plan.
- Analyze the feasibility of placing intake, discharge, and other facility infrastructure in a location that avoid impacts to sensitive habitats and sensitive species.
- 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.
- 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.
- Analyze the presence of existing discharge infrastructure, and the availability of wastewater to dilute the facility's brine discharge.
- Ensure that the intake and discharge structures are not located within a MPA [Marine Protected Area] or SWQPA [State Water Quality Protection Area]. 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."[4]

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1 2015 California Ocean Plan Chapter III.M.2.a.(2), http://www.waterboards.ca.gov/water_issues/programs/ocean/docs/cop2015.pdf, page 36, accessed January 10, 2017.

2 Chapter III.M.2.b.; *id.* at 37.

3 *Id.*

4 *Id.* at 37-38.

The OPA defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors."[5] This Appendix provides an overview of the efforts and investments West Basin has made as a California coastal water district—with the responsibility of providing reliable wholesale water supplies to millions of Californians—to investigate the best possible locations for an ocean water desalination project.

2 Analysis of the Best Available Site for an Ocean Water Desalination Plant Along the Coast of Los Angeles County

Consistent with the principles embodied in the OPA, West Basin's Ocean Water Desalination Project (Project) reviewed in this EIR is the outcome of a planning process spanning over a decade. The proposed Project represents the culmination of West Basin's stepwise approach in carefully evaluating ocean water desalination resulting in completion of approximately 26 research studies since 2000, including treatment plant siting studies, subsurface intake feasibility assessments, pilot testing at the El Segundo Generating Station (ESGS) site, demonstration testing of full-scale processes at Redondo Beach Generating Station, and development of a comprehensive *Ocean Water Desalination Program Master Plan* (PMP). The findings of these studies have helped formulate various implementation alternatives on how a desalinated water supply source could be integrated into West Basin's water supply portfolio. Additionally, the findings have helped develop the best conceptual design feasible under a range of constraints, including siting of an ocean water desalination facility, intake/discharge technologies, and treatment alternatives.

The studies have been designed to provide answers to the following OPA screening questions for determining the best available site and were used as the basis for the development of *Section 3: Project Description* in the EIR:

- Are subsurface intakes feasible?
- Is the identified need for desalination water consistent with an applicable adopted urban water management plan?
- Is it feasible to place intake, discharge, and other facility infrastructure in a location that avoid impacts to sensitive habitats and sensitive species?
- What are 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?
- What are oceanographic geologic, hydrogeologic, and seafloor topographic conditions at the site that would allow the siting of a facility, including the intakes and discharges, to minimize the intake and mortality of all forms of marine life.
- Is there the presence of existing discharge infrastructure? And is there wastewater available to dilute the facility's brine discharge?

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5 *Id.* at 54.

- Does the site ensure that the intake and discharge structures are not located within a MPA [Marine Protected Area] or SWQPA [State Water Quality Protection Area]? Can discharges 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.

2.1 Subsurface Intake Feasibility

The State Water Resources Control Board amended the California Ocean Plan on May 6, 2015 to address seawater desalination facilities. Known as the "Desal Amendments", the Ocean Plan Section III.M.2(d)(1) was amended to require, the owner or operator of a proposed seawater desalination facility must consider whether subsurface intakes are feasible to minimize intake and mortality of all forms of marine life. If not feasible, wedgewire intake screens with an opening size of no more than 1mm and a through-screen velocity of <0.5 feet per second (fps) should be used. In order to evaluate the feasibility of using subsurface intakes, West Basin has extensively evaluated the technical, economic, social and environmental feasibility of incorporating subsurface intake (SSI) systems into the project design. AS summarized below, the studies conclude that subsurface intakes would be infeasible for West Basin and hence the use of screened intake has been incorporated into the proposed Project.

2.1.1 Technical Memorandum for the Temporary Ocean Water Desalination Demonstration Project Phase A– Preliminary Design Development

In 2007, West Basin released a technical memorandum for the Temporary Ocean Water Desalination Demonstration Project to address alternative intakes (MWH 2007). The technical memorandum evaluated both surface and SSI and their capability to reduce entrainment or impingement by 95 percent or more. The survey presented several SSI types, including wells, infiltration galleries, and seabed filtration systems, and briefly evaluated each for their advantages, capabilities, suitability, and cost-effectiveness for both the ESGS and RBGS location alternatives. Four criteria were utilized to identify feasible intake alternatives including: the intake's ability to meet entrainment/impingement goals; the intake's ability to avoid significant capture of the highly contaminated freshwater lens at the coastline; the intake's precedence as a proven technology; and the intake's feasibility at a flow rate anticipated for the Local Project (defined as 42 MGD). Although the technical memorandum found that SSIs could have advantages over screened ocean intakes with regards to impingement and entrainment and pre-treatment requirements, results indicated that significant additional geotechnical feasibility studies would be required for this intake option. The study identified seabed infiltration systems as the most feasible SSI alternative for the demonstration facility, and recommended that this intake type be pursued alongside a screened ocean intake system during the demonstration phase.

2.1.2 Modified Seabed Infiltration Pilot Testing

In 2011, West Basin tested a modified seabed infiltration pilot (SIP) apparatus alongside the Demonstration Project equipment. The objectives of the SIP system were to provide an opportunity to test potential impingement and entrainment reduction and also to observe filter operational characteristics related to bed clogging. Based on these results, further modifications to the system would be contemplated to possibly test additional parameters such as wave and current characterization, and bed porosity and hydraulic conductivity of the constructed media (i.e., sediments).

The extremely low filtrate flows associated with the small-scale size of the SIP proved difficult to reliably measure and gauge the filters' operational characteristics. Additionally, preliminary test results indicated no loss of fish eggs (early development stage) in the SIP filtrate. The SIP systems' operating conditions were further refined and results evaluated; however, overall the bed flow volumes were far too low to guarantee statistically the accuracy of predation/organism fate. Because this objective/results could not be guaranteed, the decision was made to discontinue testing.

2.1.3 Ocean Water Desalination Program Master Plan

In 2013, West Basin further evaluated the feasibility of SSIs in the *Ocean Water Desalination Program Master Plan* (PMP) (Arcadis 2013). The PMP helped to define the overall key project components for seawater desalination, including the potential application of SSI technologies at the ESGS and RBGS sites. PMP *Section 4.2, Subsurface Intake Alternatives* discusses the advantages and disadvantages related to the use of SSI systems. The PMP evaluated five types of SSI technologies including:

- Infiltration galleries and Seabed filtration systems
- Horizontal collector wells
- Horizontal directional-drilled (HDD) wells (also known as "sub-seafloor drains")
- Slant wells
- Conventional vertical wells

Each SSI alternative was evaluated using six assessment criteria, including potential for groundwater contamination, sediment transport, ocean floor erosion and scour, beachfront infrastructure, environmental impacts, and seismic risk. The PMP concluded that SSI options would be less feasible than most surface intake options largely due to their potential for severe impacts to beach and nearshore seabed during subsurface well installation, the large Project area the wells would cover, and potential scouring impacts.

2.1.4 Feasibility Assessment of Subsurface Seawater Intakes

Overview

In 2015, West Basin initiated a site-specific study of subsurface seawater intakes (SSIs) to evaluate their feasibility for providing feedwater to the proposed desalination facility at the ESGS facility along the coastal margin of the West Coast Basin. The site-specific SSI feasibility assessment, which is referred to as the *Feasibility Assessment of Subsurface Seawater Intakes* (Feasibility Assessment), was conducted in compliance with the updated *2015 California Ocean Plan* (Geosyntec 2016)[6,]. The study included:

- a literature study and overview of SSIs;
- development of a general guidance tool for evaluating technical feasibility of SSIs;
- application of the guidance tool for initial screening of technical feasibility of SSIs for the proposed desalination facility at the ESGS facility; and

6 The 2015 California Ocean Plan chapter III.M defines feasible as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." The Feasibility Assessment was conducted in accordance with the May 2015 Ocean Plan Amendment Section 13142.5(b) requirements.

- field investigations and analyses to generate field data to follow for site-specific SSI feasibility evaluation.

Development of the SSI guidance tool and the Feasibility Assessment were federally funded through a grant provided by the United States Bureau of Reclamation and subjected to a transparent, public, and independent peer-review by a technical advisory panel facilitated by the National Water Research Institute (NWRI) (National Water Research Institute Website 2016). The Feasibility Assessment, site-specific data, and findings are contained in *Appendix 2, Final Feasibility Assessment of Subsurface Seawater Intakes*. These results are also discussed further in *Section 7.0, Alternatives*.

Eight SSI technologies were evaluated:

1) Vertical wells;
2) Slant wells;
3) Radial collector wells;
4) Horizontal directional-drilled (HDD) wells (sometimes called drains);
5) Seabed wells installed in trenches;
6) Seabed infiltration galleries (SIGs);
7) Beach infiltration galleries (BIGs); and,
8) Deep infiltration galleries (water tunnels).

The feasibility of SSI technologies depends on a variety of site-specific conditions and criteria including hydrogeologic, oceanographic, geochemical and water quality constraints, land use and sensitive habitat, maintenance requirements, and other technical and economic risk factors and uncertainties such as complexity of construction, performance risk, and economic viability. As such, these eight intake technologies were evaluated based on five general categories to allow for a systematic evaluation. These categories were:

1) SSI construction;
2) SSI operation;
3) treatment system operation;
4) potential inland interference; and
5) risk and uncertainty for project implementation.

These five categories were further broken down into 18 “challenge” criteria that were used to evaluate the overall feasibility of each SSI technology. Without factoring in any site-specific constraints including extent of SSI infrastructure, the initial screening results using the guidance tool developed as part of the Feasibility Assessment indicated that all the SSI technologies are theoretically feasible. Further site-specific evaluation of the SSI technologies was conducted using available local hydrogeologic information supplemented with additional geotechnical field investigations for characterization of the shallow offshore stratigraphy, and groundwater flow model simulations to evaluate SSI performance.

Based on extensive research and site-specific field-testing and analysis, none of the eight SSIs technologies were identified as feasible for the design intake rate of 40 MGD at the ESGS facility. Construction of SSIs beyond the extent of the ESGS facility would be subject to the same fatal flaws and challenges with added complications presented by residential beach front properties and protected snowy plover habit, and thus are not feasible. In addition, due to the similar setting, many of the same fatal flaws and challenges would apply to construction of SSIs at the AES Power Plant Facility at Redondo Beach, which was also considered by West Basin for the proposed desalination facility. The key findings of the site-specific SSI feasibility assessment are summarized below.

Site-Specific Findings and SSI Feasibility Assessment

Results of the field investigations indicate the presence of two shallow clayey layers beneath the coastal margin at approximately 20 feet and 50 to 60 feet depth below the seafloor. Groundwater modeling indicates that these low permeability layers would limit the potential hydraulic connection between the ocean and potential SSIs beneath the clayey layers (i.e., vertical, slant, radial collector, or HDD wells with screens beneath either or both clayey layers). Also, the clayey layers would increase the contribution to water pumped by the SSIs from adjudicated inland coastal margin aquifers, which include contaminated groundwater and areas that are de-listed for municipal use.

Moreover, pumping from SSI wells would impact the performance of the West Coast Basin Injection Barrier, which protects existing potable water supplies from seawater intrusion. And, to meet capacity demands, SSI wells would need to extend beyond the ESGS power plant facility, which would still result in drawing water from the adjudicated groundwater basin, mobilization of contamination plumes and interference with the West Coast Basin Injection Barrier.

Shallow HDD wells above the 20-foot low-permeability clayey layer would result in better hydraulic connection to the ocean, however no known examples exist of HDD wells installed at depths shallower than 20 feet below the seafloor and the presence of cobbles and gravels in the shallow seafloor sediments are a major impediment for successful drilling and installation of HDD wells. Moreover, shallow HDD wells would be vulnerable to seafloor instability and potential deposition of silts and clays on the Santa Monica Bay seafloor that can occur with El Nino storms, which could decrease the yield of the HDD wells and require difficult, expensive, and potentially damaging maintenance. The uncertain feasibility of the construction, maintenance and long-term performance coupled with an estimated cost of $80M to $120M for an intake capacity of 40 MGD to drill and install the HDD wells is an unacceptable technical and economic risk for West Basin as a public agency. Thus, HDD wells installed above the 20-foot low-permeability layer are also deemed not feasible.

Seabed wells installed in trenches were considered as an alternative to HDD wells due to the challenges associated with horizontal drilling above the low-permeability layer approximately 20 feet below the seabed, and the presence of cobbles and gravel above the shallow low-permeability layer (Geosyntec 2017). The estimated capital cost to construct a system of 14 seabed wells to produce 40 MGD of intake water is at least $372M.

Beach infiltration galleries are considered technically infeasible due to the high-energy environment resulting from exposure to long period swells from Gulf of Alaska winter storms. This results in beach erosion and nourishment cycles, with associated migration of the beach and surf zone that would compromise the performance of beach infiltration galleries.

Seabed infiltration galleries are considered infeasible due to the requirement to be located beyond the "closure depth" where there is minimal change in seafloor elevation over time. Due to the high-energy environment at El Segundo the closure depth is approximately 6,500 feet offshore at about 50 feet depth (Jenkins 2015). Construction at this offshore location, depth, and high-energy environment would require specialized methods with estimated life-cycle costs of ranging from $192M to $411M, or $4.8M to $11.0M per MGD of capacity, respectively, for an intake capacity of 40 MGD; while the costs of the wedgewire screen only option would range from $12M to $25M, or $0.3M to $0.6M per MGD of capacity, respectively. This represents a 16-fold increase in the overall estimated total costs if full-size seabed infiltration galleries meeting 100 percent intake requirement was to be used.

The life cycle costs were also estimated for hybrid 40 MGD intake systems consisting of both an open ocean intake wedge-wire screen (WWS) and a seabed infiltration galleries for a range of capacities (Geosyntec 2017). Lowering seabed infiltration galleries intake rates could decrease the overall intake costs but it would diminish the economies of scale. For example, the estimated costs for a SIG intake rate of 2.5 MGD accounting for 6 percent of the intake requirements (i.e., 2.5 MGD out of a total of 40 MGD) would range between $53M and $113M, or $21.2M and $45.2M per MGD of capacity, respectively. This translates to approximately four times of the estimated total costs of the WWS only option or, on a cost-per-unit-volume-water-intake basis, more than 70 times more expensive than the WWS only option. (**Appendix 2B, Seabed Infiltration Gallery Construction and Life-Cycle Costs**).

Moreover, potential deposition of silts and clays on the Santa Monica Bay seafloor can occur with El Nino storms and decrease the performance yield and require difficult, expensive, and environmentally disrupting maintenance of the SIGs. These represent unacceptable technical and economic risk for West Basin.

Similarly, deep infiltration galleries (water tunnels) are not a proven technology for offshore marine alluvial settings. The extreme construction complexity coupled with potentially high technical risks and lack of precedence for comparable conditions, result in deep infiltration galleries being deemed technically and economically infeasible for West Basin.

Based on the infeasibility of the subsurface intake option, the use of screened intake per OPA requirements was incorporated into the conceptual design of the project (*Section 3: Project Description*) and reviewed in this EIR.

2.2 Onshore Site Option Feasibility

West Basin has evaluated alternative sites for its ocean desalination program over a decade of research, including the completion of the Ocean Water Desalination Demonstration Facility Project (OWDDF) from 2006-2009 and more detailed alternatives siting studies for the Ocean Desalination Program Master Plan (PMP) in 2013. Below are the summaries of the findings of the studies that support the consideration of the ESGS site as reviewed in the EIR.

Ocean Water Desalination Demonstration Facility (OWDDF)

West Basin performed the analysis of best available sites as part of the Ocean Water Desalination Demonstration Facility (OWDDF). West Basin performed various studies for the OWDDF project between 2006 and 2009, including a certified Final EIR in December 2008 and regulatory permitting in 2009. The overall scope and development of the OWDDF was defined through the preparation of several technical memoranda (TM) spanning topics from water assessment, alternative treatment process, operations and maintenance requirements, and permitting. TM-6, Physical Siting, analyzed environmentally appropriate locations for the physical siting and co-location of an ocean water desalination facility.[7] Initial TM-6 research considered a wide range of potential sites evaluated for overall implementation feasibility including availability, site size, physical constraints, zoning requirements, social constraints, environmental permitting constraints and other factors. These initial sites included (as discussed further below) the Chevron Marine Terminal, NRG's ESGS site, AES's RBGS site, and the SEALab property in Redondo Beach. In developing TM-6, West Basin studied multiple site options within RBGS and ESGS.

The final TM-6 focused on evaluating the OWDDF at three potential sites located within the West Basin service area including: 1) SEALab, located at 1201 North Harbor Drive, Redondo Beach, CA; 2) RBGS, located at 1100 North Harbor Drive, Redondo Beach, CA; and 3) the ESGS, located at 301 Vista del Mar, El Segundo, CA based on the constraints considered. TM-6 evaluates these three locations for their co-location compatibility, isolation from current site operations, utilization and preservation of existing facilities, and accessibility for public education. The site evaluation provided in TM-6 identified potential siting constraints for the OWDDF, as well as those for the potential future siting of a full-scale facility.

The data collected from the OWDDF technical memoranda served as a foundation for the development of a full-scale design, permitting, and operations approach, which is presented in the PMP.[8] The PMP focused on the feasibility of two siting alternatives: the ESGS and RBGS. The ESGS and RBGS were evaluated for their potential to support alternative intake and discharge facilities (including the feasibility of subsurface intakes), individual treatment process engineering and technological requirements based on source water quality, conveyance and distribution requirements, system integration and treated water quality requirements, environmental and permitting requirements, power supply development, capital and operations and maintenance costs, project delivery, and operational requirements.

As discussed in *Section 7.3.2: Site Alternative: AES Redondo Beach Generating Station* in the EIR document, the existing RBGS intake/discharge areas have historically possessed higher resident ichthyoplankton abundances than the ESGS site, due to the King Harbor's well-documented artificial and rocky reef habitat. The ESGS intake/outfall structures are situated in a sandy bottom habitat with minimal rocky reef habitat. The sandy bottom habitat type supports only a small fraction of the biomass supported by traditional rocky reef habitat.

In 2006, fish abundance counts documented higher levels of marine life present at the RBGS Intakes Units 7 and 8 than present at the ESGS intake. Sampling efforts at the RBGS Intake 7 and 8 yielded a mean fish density of 828 fish/1,000 m3 while intake sampling at the ESGS yielded a mean fish density of 516 fish/1,000 m3. The RBGS Units 1-6 intake, which is located within King Harbor, had a mean fish density of more than 1000 fish/1,000 m3. Given that RBGS represents a marine environment that support richer and more diverse species, an ocean water desalination facility would result in significant marine life impacts. Hence, ESGS was selected as the proposed project site for review in this EIR. Additionally, as discussed in Section 7.2, *Initial Screening of Alternatives*, the EIR also evaluated the Chevron Marine Terminal site located immediately north of the ESGS site within West Basin's service area in more detail (Section 7.2, *Initial Screening of Alternatives*), but found that the site would be too small for the Local Project and may

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7 MWH, *West Basin Municipal Water District Temporary Ocean Water Desalination Demonstration Project Phase A- Preliminary Design Development*, TM-6 Physical Siting, May 18, 2007.

8 Malcom Pirnie, *Ocean Water Desalination Program Master Plan*, January 2013

not have the outfall capacity to support the additional flows produced by the Project.

2.3 Commingling Brine with Wastewater Feasibility

As stated in the Ocean Plan, the preferred technology for minimizing intake and mortality of all forms of marine life resulting from brine discharge is to commingle brine with wastewater. West Basin conducted a technical study to evaluate conveying brine to the Hyperion Water Reclamation Plant (Hyperion) located in the City of Los Angeles. Under this scenario, brine would be blended with treated wastewater for discharge into the Pacific Ocean via an existing Hyperion-owned ocean outfall structure.

Hyperion is located approximately half a mile north of the ESGS property in the City of Los Angeles. Originally constructed in 1925, Hyperion is owned by the City of Los Angeles Bureau of Sanitation (LASAN) and has a treatment capacity of 450 MGD. Under wet weather conditions, Hyperion is permitted to treat up to 800 MGD.[9] Hyperion has three outfalls including an operational five-mile outfall, a one-mile emergency outfall, and an abandoned seven-mile sludge outfall. The five-mile outfall currently discharges dechlorinated secondary-treated effluent through a Y-shaped diffuser at a water depth of approximately 187-feet. The one-mile emergency outfall is located south of the five-mile outfall and discharges at water depth of approximately 50 feet. The seven-mile abandoned outfall is located north of the five-mile outfall.

This discharge configuration would not require the installation of a concentrate discharge structure, such as a multiport diffuser system, as the brine and waste backwash water produced at the desalination facility is assumed to be adequately diluted when blended with Hyperion's treated wastewater such that it could be directly discharged into the Pacific Ocean using the plant's existing outfall diffusers. However, implementation of the Hyperion alternative would require addressing Hyperion's existing NPDES permit to ensure the existing outfall has adequate capacity to support the brine generated under the proposed Project. As the Hyperion outfall is operated and managed by the City of Los Angeles Department of Sanitation, West Basin would not have local control over this discharge alternative.

A feasibility study was conducted by Carollo Engineers in December 2016 to evaluate blended discharge with Hyperion's treated wastewater; refer to **Appendix 11: Ocean Water Desalination Discharge Feasibility Study**. Various connection locations and pipeline route alternatives to connect the Project site to Hyperion were analyzed based on their technical feasibility, including variations of conveyance along the beach and along Vista Del Mar. The beach alignments all traverse Dockweiler State Beach and snowy plover Critical Habitat. Overall, all of the connection locations and two of the pipeline routes were found to be infeasible in consideration of regulatory requirements associated with future Hyperion low flow conditions. Based on the steady decline of secondary effluent flows to Hyperion due to increases in water conservation and recycling, the study projected that the available capacity of the Hyperion outfall will continue to increase over time. Consequently, the salinity of the commingled discharge would continue to increase as the secondary effluent flows continue to decrease. As a result, the study found that a commingled discharge would not meet NPDES permit requirements. This study concluded that commingling brine with Hyperion effluent to be technically infeasible given regulatory requirements, future reductions in Hyperion flows, and current outfall diffuser configuration.

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9 City of Los Angeles Department of Sanitation, Hyperion Water Reclamation Plant, https://www.lacitysan.org/san/faces/home/portal/s-lsh-wwd/s-lsh-wwd-cw/s-lsh-wwd-cw-p/s-lsh-wwd-cw-p-hwrp?_adf.ctrl-state=17gyzux17i_4&_afrLoop=27665301624795526#!, Accessed June 13, 2016.

Based on the infeasibility of the commingling brine with wastewater option, the use of multiport diffusers per OPA requirements was incorporated into the conceptual design of the project and reviewed in this EIR.

3 CONCLUSION

Based on the analysis presented in Section 2 above, the proposed project review in this EIR represents a product of West Basin's stepwise approach to siting an environmentally responsible ocean water desalination project. The followings are to summarize how these studies address the screening questions to allow for the development of the best available onshore site, the best technology and site for the intake and discharge and the overall design as described in *Section 3: Project Description* of the EIR.

- ***Are subsurface intakes feasible?*** As detailed above (Section 2.1), the findings of the subsurface feasibility have determined that the use of subsurface intake along the coast of Santa Monica Bay is infeasible. Hence, the findings support that screen intakes would be required.
- **Is the identified need for desalination water consistent with an applicable adopted urban water management plan?** As discussed in Section 2.3, *Need for the Project* and elsewhere in this EIR, the Local Project is consistent with West Basin's 2010 and 2015 UWMP as well as MWD's 2016 UWMP.
- ***Is it feasible to place intake, discharge, and other facility infrastructure in a location that avoid impacts to sensitive habitats and sensitive species?*** The Project proposes to use existing ESGS intake and discharge tunnels to minimize marine impacts. These existing facilities are in a section of the Santa Monica Bay with predominantly sandy ocean floor that has lower ichthyoplankton concentrations compared to other part of the Santa Monica Bay, such as RBGS. See above discussion (Section 2.2) and refer to Section 5.11, *Marine Biological Resources* and Section 7.3.2, *AES Redondo Beach Generating Station* for additional discussion.
- ***What are 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?*** The EIR provides a detailed discussion of Project effects on marine life, including estimates of marine life impacts and marine life mitigation. Refer to Section 5.11, Marine Biological Resources for additional discussion.
- ***What are oceanographic geologic, hydrogeologic, and seafloor topographic conditions at the site that would allow the siting of a facility, including the intakes and discharges, to minimize the intake and mortality of all forms of marine life***? The Project proposes to use existing ESGS intake and discharge tunnels to minimize marine impacts. These existing facilities are in a relatively benign section of the Santa Monica Bay with predominantly sandy ocean floor and lower ichthyoplankton concentrations than at RBGS. See above discussion (Section 2.2) and refer to Section 5.11, *Marine Biological Resources* and Section 7.3.2, *AES Redondo Beach Generating Station* for additional discussion.
- ***Is there the presence of existing discharge infrastructure? And is there wastewater available to dilute the facility's brine discharge***. The ESGS and RBGS sites have existing intake and discharge infrastructure. West Basin evaluated the feasibility of sending the brine to the Hyperion

Wastewater Reclamation Plant for blending, but rejected this discharge alternative as infeasible. Refer to Appendix 11, *Ocean Water Desalination Discharge Feasibility Study*.

- ***Does the site ensure that the intake and discharge structures are not located within a MPA [Marine Protected Area] or SWQPA [State Water Quality Protection Area]? Can discharges 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***. There are no MPAs or SWQPAs near the intake or discharge facilities for the Project. An SMCA and SMR are located over 22 miles to the northwest of the Project site at Point Dume in the Malibu region, and a SMR and a SMCA are located over seven miles south of the Project site at the Palos Verdes Peninsula, all established in 2012. There are no Areas of Special Biological Significance (ASBS, which is an SWQPA) near the Project.[10] The Project's salinity impacts are reduced to within 100 meters of discharge pursuant to the OPA.

10 State Water Resources Control Board Website, California's Areas of Special Biological Significance, http://www.swrcb.ca.gov/water_issues/programs/ocean/asbs_map.shtml, Accessed February 9, 2017.