ACTION TEAM REPORT

Repurposing Phillips 66: Conceptual Desalination Environmental Constraints Analysis

The following report consists of five student-developed draft environmental constraints analyses for a hypothetical desalination plant at the existing Phillips 66 Santa Maria Oil Refinery in southern San Luis Obispo County. This analysis was commissioned by the ERI in support of ERI Objectives 2.2, repurpose Phillips 66 Santa Maria Oil Refinery and surrounding Oceano Dunes area, and 3.4, support desalination and other water infrastructure projects.

While these student reports have not been independently verified for accuracy, and are therefore informational only, the ERI hopes this analysis promotes a community conversation on potential repurposing uses of the Phillips 66 SMR, which is currently scheduled for closure in 2023. Repurposing the refinery will not only create new jobs that help offset the loss of existing jobs at the refinery, it could also prevent the facility’s infrastructure from becoming a “stranded asset” of untapped potential. A desalination plant is just one of several ways the refinery could be used in the future, and a separate student project completed concurrently explored additional uses including green hydrogen generation, grid-scale battery storage, an anaerobic digester, plastics recycling, and conservation.

These student reports were completed as a part of the Cal Poly undergraduate Natural Resources course, Applied Resources Analysis and Assessment (NR 425), taught by Professor Sarah Spann. During the Spring 2021 term, students worked in teams of five or six to develop an environmental constraints and permitting analysis for a real-world client and potential project. This research was facilitated in part by the Institute for Climate Leadership and Resilience at Cal Poly.

DISCLAIMER

The following documents have been prepared as part of the undergraduate curriculum for NR 425 (Applied Resources Analysis and Assessment) at California Polytechnic State University, San Luis Obispo. The intent of this academic exercise was to simulate the real-world process of preparing an environmental constraints and permitting analysis; however, it is important to note that the environmental and permitting constraints identified herein have not been technically peer reviewed by subject matter experts. This document is to be used for informational purposes only.

These student-level analyses were prepared on behalf of the Central Coast Economic Recovery Initiative (ERI), but these reports have not been independently verified by the ERI or others, and the ERI makes no guarantees as to the accuracy of the claims or data therein. These reports should be considered preliminary, unofficial, and informational only. Note that the students created fictitious consulting firms as part of the real-world simulation of their assignment.
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Nipomo Mesa Desalination Plant Project
Santa Maria, CA

Spring 2021
Prepared by: Oso Flaco Consulting Group
Nipomo Mesa Desalination Plant Project

Environmental Constraints Analysis

NR 425: Applied Resource Analysis
Phillips 66 Refinery
Santa Maria, CA

Submitted to:
Central Coast Economic Recovery
Cal Poly Institute for Climate Leadership
Oceano Economic Development Council

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1. Nipomo Mesa Desalination Plant Project Description

1.1. Project Objectives

The project objectives are multifaceted, aiming to address issues in the San Luis Obispo County region spanning from socioeconomic resource issues to environmental issues. This report will identify the environmental constraints associated with all phases of the project after remediation of the site, which is to be completed by the applicant. Specific objectives are as follows:

- Mitigate the impacts of the COVID-19 pandemic on the Central Coast region through economic recovery plan that focuses on clean energy investment, sustainable tourism, and creation of jobs.
- Increase resilience of local economy to withstand future economic shocks through strategies that seek to make the regional economy more economically and environmentally resilient and diverse.
- Utilize the untapped potential of talent and resources in local community through collaboration and inter-agency partnerships.
- Work to resolve the water supply issues of the region through desalination of ocean water.
- Reduce stress on groundwater basins in the region by providing an alternative water source.
- Remediate former refinery site and repurpose refinery facility.
- Preserve habitats and ecosystems located within the project site, as well as the nearby Environmentally Sensitive Habitat Area (ESHA), Oso Flaco Creek, freshwater lakes, and Pismo Dune area.
Figure 1: Phillips 66 Santa Maria Refinery project location in San Luis Obispo County, California.
Figure 2: Project site location and Sensitive Resource Area (SRA) combining designation - San Luis Bay
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1.2. Existing Site Characteristics

1.1.1. Current and Historic Use

The project site is the current residence of the Phillips 66 refinery. The refinery has been in operation for roughly 60 years on the Nipomo Mesa. Of the 1,780-acre land owned by Phillips 66, only about 200 acres was used for company operations. The remainder was used for cattle grazing, open space, and wildlife preservation. This area has seen a good amount of expansion in the late 1900’s. In the mid-20th century, there was a major depletion of the aquifer due to overdraft for agriculture. Due to the construction of the Twitchel Dam the aquifer began to replenish in the 1980’s. Which caused a spike in population and expansion reducing the amount of open space. The Nipomo Mesa is a known Chumash archaeological site, and many cultural resources can be found on near the current site.

1.1.2. Planning Area

The Phillips 66 refinery is located at 2555 Willow Road in the City of Arroyo Grande, California. The refinery is located within California’s Central Coast region and is 172 miles north of Los Angeles, California. The project site latitude is 35° 2' 22.7508" and longitude is 120° 35' 19.6542". It is adjacent to state HWY 1 off Willow Rd.

1.1.3. Land use/combining designations/zoning

Current uses of the area include cattle grazing, open space, and preservations. While the Phillips 66 Refinery is no longer in operation, the site is designated as an industrial land use. Population began to increase after the construction of the Twitchel Dam. The area is mainly used for urban development and open space, but some areas of the Nipomo Mesa near the project site are used for recreation. The San Luis Bay is part of the Sensitive Resource Area (SRA) combining designation. The Phillips 66 refinery is located just slightly east of the San Luis Bay SRA. Within the San Luis Bay, projects requiring Conditional Use Permit approval shall concentrate proposed uses in the least sensitive portions of properties. Native vegetation shall be retained as much as possible.

1.3. Project Phases

This section provides a general overview of the major phases that would be required to repurpose the existing project site and develop and operate a desalination facility. The three primary phases include refinery decommissioning and remediation, desalination plant construction and operation, and environmental restoration. An additional step for project funding, design, and approval would occur before the desalination plant could be built; however, this report will focus on the phases that will affect the physical, biological, and chemical properties of the site. A generalized project schedule is included in Figure 14: Preliminary Project Timeline.
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1.1.4. Phillips 66 Santa Maria Refinery Decommissioning and Remediation

Before any new development can occur on the Project site, the existing Phillips 66 Santa Maria Refinery facility must be decommissioned and remediated. Historically, oil refinery locations have been found to carry large deposits of coal and petroleum in their soils long after the refineries are closed. It is also important to note that groundwater is historically known to be contaminated by oil refineries. Currently, the US EPA has the Phillips 66 Santa Maria Refinery site location listed as one of the locations in their “Cleanups in My Community” and the groundwater migration action is currently listed as “Not Controlled”1. This location may potentially need remediation for groundwater resources as well and another preliminary study to analyze the current existing conditions of the groundwater should be performed.

Decommissioning plans need to be prepared and executed alongside environmental permitting authorizations. Planning, engineering, environmental studies and compliance, removing piping, removing platforms, and disposing of waste are major steps in decommissioning an oil refinery (NES Fircroft2). For the purposes of this analysis, it is assumed that the decommissioning and remediation process would be completed by the current owner of the property. Addressing the potential environmental impacts associated with the decommissioning and remediation phase is outside of the scope of this report.

1.1.5. Desalination Plant Construction and Operation

Construction and operation of the proposed desalination plant would occur entirely within the existing 183.6-acre refinery facility footprint located on Assessor Parcel Number (APN) 092-401-011 and APN 092-401-0053. The location of support infrastructure (e.g., pipelines, transmission lines, etc.) is unknown at this time and should be designed based on the results of the constraints analysis.

The phase of construction is likely the most costly and time consuming phase. Construction is broken up into repurposing the existing site for the desalination plant and upgrading infrastructure. Due to the differences between an oil refinery and a desalination plant, it is assumed that none of the existing facilities would be reused other than the roads. The pipelines, utilities, and electrical services that would accommodate the desalination plant do not match the facilities currently in use by the Phillips 66 Santa Maria Refinery. The current roads would be used for construction of the new desalination plant as well as be re-used for access to and from the plant when it is fully opened.

New infrastructure would consist of pipelines, buildings, filtration systems, pumping stations, and waste treatment. Additional details regarding the infrastructure required for a desalination facility is included in the “Desalination Plant Components” section below. In addition, due to the

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increased need for electrical power, it is assumed that the construction phase would include the development of new transmission lines and other required infrastructure upgrades.

1.1.6. Ecological Restoration

Another key phase of the proposed project involves the ecological restoration of the remainder of the Phillips 66 property located outside of the current facility footprint. This includes approximately 1,645 acres located on the following APNs: 091-141-062, 092-391-034, 092-391-020, 092-391-021, 091-192-034, 092-401-005, 092-401-011, 092-401-013, 092-411-005, and 092-411-002.

Restoration efforts will be directed towards improving the environmental and ecological condition of the degraded dune habitat and the degraded Little Oso Flaco Creek. Restoration efforts can take a variety of years based on the ecosystem being restored, the goal of restoration, and the funding and support for the restoration. For the project site, restoration would occur after the majority of the infrastructure was built and would continue for several years to account for ongoing monitoring and adaptive management measures.

1.4. Desalination Plant Components

The proposed desalination plant is recommended to be constructed on the 200 acres (of the 1,780-acre property) currently occupied by the Phillips 66 Santa Maria Refinery campus as to avoid occupying any undisturbed land or habitats. This section will provide an overview of the typical components of a seawater reverse osmosis (SWRO) desalination plant. Reverse osmosis is a widely employed water purification technology and is the leading process for desalination. Reverse osmosis uses applied pressure to induce water permeation through a semipermeable membrane while omitting salts. This process uses less energy than most thermal distillation technologies. This process also requires extensive pretreatment to prevent critical failure of the membrane during operation.

Desalination plants can vary significantly in size, based on desired output. For reference, the largest desalination plants in California are found in Carlsbad and Huntington Beach. Both facilities were designed to produce 50 million gallons per day (MGD) or 56,000 acre-feet per year (afy) of potable water. The Carlsbad beach desalination facility occupies a 4-acre parcel. The Huntington Beach plant spans 11 acres.

Due to the lack of project design details or guidelines, this report provides three options for possible desalination plant sizes, production amounts, and energy consumption values (refer to Table 1: Typical Desalination Plant Size) based off California water trends and residential

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energy consumption data. The actual size of the desalination plant will be decided by the stakeholders and based on local limiting factors such as available industrial zoning space, energy consumption, amount of water produced, and is that water enough to supply an appropriate amount of community members.

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Table 1: Typical desalination plant sizes

<table>
<thead>
<tr>
<th>Water Production Supply (Daily Average)</th>
<th>Community Household Supply (Daily Average)</th>
<th>Energy Consumption by Plant (Daily Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 million gallons</td>
<td>375,000 gallons</td>
<td>405 mwh (megawatt hours)</td>
</tr>
<tr>
<td>50 million gallons</td>
<td>625,000 gallons</td>
<td>675 mwh</td>
</tr>
<tr>
<td>80 million gallons</td>
<td>1,000,000 gallons</td>
<td>1,060 mwh</td>
</tr>
</tbody>
</table>

The following paragraphs provide additional details regarding the typical components required for the construction and operation of a SWRO facility (refer to Figure 3: Example SWRO Facility Schematic).

1.1.7. Intake System

The first step in a desalination treatment plant is the intake of ocean water and delivery to the plant. The intake location and type can vary - onshore intake, offshore intake, deep-water intake, and sub-seafloor intake are all potential options. The use of beach wells would substantially increase the risk of seawater intrusion into the regional groundwater basin. The inflow structure is subject to regulation by the EPA due to potential impacts to aquatic wildlife. The proposed solutions to these potential impacts include withdrawing water at such a rate as to allow wildlife

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1 https://www.filtnews.com/reverse-osmosis-for-desalination/
to escape the intake structure or locating the intake structure outside areas of high biological productivity.

For the purposes of this analysis, we are assuming that an offshore intake pipeline would be installed along with an onshore pumping station located at the plant facility. This would allow the plant operators to control the speed of the pumping and the quantity of water being pulled through the intake system. A gate valve can be built to control the flow and a screening system can be installed to remove larger particles. For example, at the Sydney Desalination Plant\footnote{City of Carlsbad. (2005, December). Carlsbad Desalination Plant EIR. 12, May 2021. \url{https://www.carlsbaddesal.com/eir.html}}, a drum screen filters out particles that are 3 millimeters or more in diameter. The Sydney plant has their offshore structure 300 meters offshore with intakes resting on the ocean bed 25-30 meters below the surface. The intake rate is very low in order to not harm the nearby wildlife and they also built artificial reefs around the intakes.

It is assumed that the construction of the pipeline would be completed through one of the three trenchless methods: horizontal directional drilling (HDD), micro-tunneling, or auger boring. HDD requires that a pilot hole be created and once complete it is enlarged to fit the pipeline by “pre-reaming” it. The pipeline is then attached to the reamer which is connected to the drill string. A drilling rig is then used to pull the attached reamer and pipeline to the other side. Installing a pipeline via the micro-tunneling method encompasses utilizing “a remotely controlled micro-tunnel boring machine combined with the pipe jacking technique.” The auger boring method creates a bore hole using a rotating cutting head. HDD and micro-tunneling can lead to hydro-fracturing while auger boring has limitations on accuracy and where it can be used\footnote{City of Carlsbad. (2005, December). Carlsbad Desalination Plant EIR. 12, May 2021. \url{https://www.carlsbaddesal.com/eir.html}}.

### 1.1.8. Pretreatment Facilities

Pretreatment is the first stage of the desalination process. When seawater arrives at the plant, it goes through a pretreatment process to remove particulates, debris, microorganisms, suspended solids and silt from the source seawater prior to reverse osmosis separation. In actuality, however, pretreatment systems remove most but not all of the suspended solids contained in the seawater. The suspended solids, particulates and silt that remain after pretreatment accumulate on the surface of the RO membranes and cause loss of membrane productivity over time. In addition, because seawater naturally contains bacteria as well as dissolved organics, a biofilm of bacteria can form on the membrane surface.

Two types of pretreatment systems are typically used to protect the SWRO membranes from fouling: conventional granular media filtration and membrane filtration. Currently, conventional granular media filtration is the predominant pretreatment technology for large and medium size
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desalination plants\(^6\). In this process, seawater is pumped into multimedia filter tanks, which typically include layers of anthracite and sand atop a bed of gravel (refer to Figure 4: Conventional Granular Media Filtration). The filtered material is then separated out and pumped back to the ocean.

Before seawater enters the reverse osmosis filters to remove the salt particles, it must go through a second stage of pretreatment called microfiltration to remove smaller (oftentimes microscopic) impurities. At this point, virtually all impurities other than dissolved salts and minerals have been removed from the water, but it still needs to go through one more step to remove the dissolved salts and minerals to be ready for drinking. Once filtered, the water moves into the next stage of desalination.

![Figure 4: Conventional Granular Media Filtration](image)

**1.1.9. Reverse Osmosis Treatment Facilities**

The RO treatment is the center of the desalination process. RO systems leverage a semi-permeable membrane to remove ions, molecules, and unwanted contaminants and particles (salt in the case of desalination) from water. Reverse osmosis works by pushing water – under intense pressure – though semi-permeable membranes to remove dissolved salts and other impurities (refer to Figure 5: Example Pressure Vessel). High pressure pumps carry the water through the

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\(^6\) [https://www.carlsbaddesal.com/how-it-works.html](https://www.carlsbaddesal.com/how-it-works.html)
membranes. Much of the energy expended by the high-pressure pump is not used. Thus, an energy recovery device can be installed to reduce the total energy demand by 30%.

These membranes act like microscopic strainers that allow only water molecules to pass through, leaving behind the salt, minerals and other impurities such as bacteria and viruses. At the Tampa Bay Seawater Desalination Facility, the membrane pore size is 0.001 microns or 1/100,000th the size of a single human hair. At the Sydney Desalination Plant, there are 8 membranes per pressure vessel with a total of 36,000 membranes installed in the system (Sydney Desalination Plant). The size of the RO facilities will vary greatly depending on the water production capacity of the facility. For example, the Carlsbad Desalination Plant RO building contains more than 2,000 pressure vessels housing more than 16,000 reverse osmosis membranes.

1.1.10. Post Treatment Facilities

After the RO process, water typically undergoes chemical conditioning in product water post treatment facilities. Lime and carbon dioxide are used for post-treatment stabilization. The water then goes through a process called chlorination where chlorine is added in the form of ammonia and sodium hypochlorite to disinfect the water to the standards of the local health services standards.

1.1.11. Product Water Storage

Once the desalination process is complete, the water moves to storage tanks before being pumped to local water purveyors and blended with the regional water supply.

1.1.12. Chemical Storage and Handling Facilities

A wide range of chemicals are used extensively in the desalination and water treatment business. Substances used typically falling into one of two main groups. The first group, known as ‘online’ chemicals, includes coagulants, flocculants, chlorination and de-chlorination agents and biocides. The second group, often called ‘offline’ chemicals, includes a large number of somewhat stronger chemicals that can be used for a variety of purposes such as dissolving the fouling that attaches to filtration membranes during operation.

Typically, various chemicals associated with the desalination process are stored on site. Some commonly stored chemicals include sodium hypochlorite, sodium hydroxide, sodium tripolyphosphate, sodium dodecylbenzene ammonia, lime, ferric sulfate, citric acid, and sulfuric acid. Chemicals must be stored in accordance with Federal, State, and local standards.

1.1.13. Concentrate Management

High levels of Total Dissolved Solids (TDS) concentrates (>65,000 mg/L) are produced by RO plants, which may also contain some toxic chemicals used during feedwater pretreatment and post-treatment. The concentrate from desalination (often referred to as brine) varies in composition and volume depending upon the nature of the source water. This makes Concentrate Management necessary to prevent significant environmental impact. Selection of management strategies depends on several factors: the concentrate volume and quality, the location of the desalination plant, and the pertinent environmental regulations. The following paragraphs explore examples of concentrate management practices often used, along with the benefits and drawbacks of each, then give recommendations based on the site specifics. The most used options are surface water discharge, submerged disposal, sewer disposal, deep well injection, land application, evaporation pools, and zero liquid discharge (Hanley).

**Surface Water Discharge.** This method involves disposing the concentrate in waterways adjacent to the plant including tidal rivers and streams, oceans, estuaries, or bays. Environmental concerns include long-term effects on the water quality of coastal aquifers and adverse impacts on the receiving waters’ ecosystems.

**Submerged Disposal.** In this method the concentrate is transported away from the desalination plant via underwater pipes to an estuarine and/or ocean location. Environmental concerns include potential impact of sinking briny concentrate on benthic marine organisms living on the sea bottom.

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**Deep Well Injection.** Deep well injections greatly depend on the geological setting. For example, a porous layer and aquifer would be required near the site. Additionally, construction of deep injection wells can be costly. Depths vary among areas on how deep the well would need to go. An EPA permit is required to verify the well would be stable for injection. Lastly, groundwater quality could be impacted due to injection.

**Sewer Disposal.** Sewer disposal is a relatively inexpensive and straightforward disposal option. The liquid waste would be sent to a treatment plant used by the area. Options with this include concentrate discharge to the front or the back of the wastewater treatment plant. Discharge to the front is not recommended as conventional wastewater treatments do not remove TDS, which can result in significant impact on the biological treatment process of the wastewater. Discharge disposal to the end of the wastewater treatment plant mixes with the treated wastewater, resulting in a diluted concentrate. Drawbacks to this option include the cost of constructing an additional pipeline (and possibly a pump) connecting the two separate plants, as well as the possibility of adversely impacting receiving water despite the dilution. This may be a viable option for concentration disposal, as the Santa Maria Wastewater Facility is nearby, directly 12.5 driving miles southwest of the proposed project site. Additional research into the impact of this process on receiving water is recommended. Correspondence with the wastewater treatment plant would also be needed to be assessed if the plant has the ability to integrate with the desalination plant.

**Evaporation Ponds** are another option, constructed with liners and allow water evaporation while the salts accumulate at the bottom of the pond. These ponds are cost effective and demand low energy input, but are best suited for arid regions, as moist air will decrease evaporation rates. The main problems with evaporation ponds is the large area needed to hold the substantial volumes of liquid. The ponds must be at a shallow depth to allow for evaporation, causing small volumes to be held even when using large areas. In recent years, technology has been developed to decrease the land area needed for ponds, which may be explored for the project site. Monitoring is essential for this process due to the exposure to wildlife. There is also a risk of groundwater contamination due to pool leakage.

**Land Application.** This method involves application of the concentrate to salt-tolerant crops or vegetation. Feasibility of this method depends on the local climate, land availability, location of the groundwater table, and vegetation tolerance to salinity.

**Brine Concentrators.** Technologies such as brine concentrators are relatively new but promise large scale minimization in brine discharge volumes by extending the range of RO filtering membranes to that of thermal evaporation. This process uses heat exchangers, deaerators, and vapor compressors to convert the traditional liquid concentrate produced to a more slurry, concentrated form. With this technology, brines can be concentrated up to 130,000 mg/L, which minimizes the total amount of brine being sent out for disposal. Downsides to this method including locating a disposal site for high concentrates of salts, ions, and chemicals and increased energy requirements to accomplish this.
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**Zero liquid discharge.** The zero liquid discharge method is another fairly new technology that employs an evaporation process to turn brine into a dry solid. This process would not be best suited for this project because it is extremely energy intensive, expensive, and pairs the best with thermal desalination technologies, not reverse osmosis.

The environmental constraints analysis section below will focus on the **submerged disposal** option for concentrate management. Reasons for this include:

- It is one of the most common methods in practice at other existing desalination plants.
- Under the Desalination Amendment to the California Water Resources Control Board, if the toxicity levels in concentrated discharge are below recently established thresholds, submerged disposal would be considered acceptable with mitigation applied.

1.1.14. Distribution

The project will be designed to deliver freshwater for domestic consumption, landscaping, agricultural uses, and potentially ecological restoration of impaired local freshwater streams. The extent and location of distribution pipelines is unknown at this time and will not be included as part of the environmental constraint's analysis.

1.5. Ecological Restoration Components

The ecosystems of the project site include coastal dunes, freshwater lakes, wetlands, and marshes. The ecosystems have similar threats from intensive recreation and invasive species. Restoration efforts will be directed towards improving the environmental and ecological condition of the degraded dune habitat and the degraded Little Oso Flaco Creek. The primary components of the ecological restoration phase are outlined in the paragraphs below.

1.1.15. Dune Habitat Restoration

Dune restoration typically begins with the removal of over-stabilizing invasive vegetation. In many cases, that action alone is sufficient to return the system to the point where native species can recolonize, and communities can recover. In other cases, more intensive intervention is needed. Often in these cases, fencing will accompany the planting of native species. Sand fences help promote effective dune formation. All dune restoration efforts will measure success with regular monitoring and maintenance.

1.1.16. Little Oso Flaco Creek Restoration

The USDA Guidance for Stream Restoration lists nine steps for a successful a restoration effort.

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10 Need references for this section (mostly came from “Dunes Environmental Group” Document.)
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1. Identify problems and opportunities
2. Determine overall goals and specific objectives
3. Inventory resources
4. Analyze resource data
5. Formulate alternatives
6. Evaluate alternatives
7. Make decisions
8. Implement the plan
9. Evaluate the plan

There are numerous strategies for effective stream restoration. Different methods are useful for remedying different issues. In the case of Little Oso Flaco Creek, a study from the Coastal San Luis Resource Conservation District recommended biofiltration methods appropriate for farming activities and soil types. These methods include:

**Filter Strips.** A filter strip is an area of grass or other permanent vegetation used to reduce sediment, organics, nutrients, pesticides, and other contaminants from runoff and to maintain or improve water quality.

**Vegetated Waterways.** A vegetated waterway is a constructed channel that is shaped or graded to the required dimensions and established in suitable vegetation for the stable conveyance of runoff. It conveys runoff without causing erosion or flooding and improves water quality.

**Vegetated Retention Ponds and Basins.** Vegetated retention ponds and basins are meant to collect stormwater and slowly release it at a controlled rate so that downstream areas are not flooded or eroded.
2. Stakeholders

For this project there are going to be numerous regulatory and public agencies that will have personal stake for each part of this project process including each effect their project will have on the area. This stakeholder analysis will outline each existing and potential stakeholder that will be involved. In table 2, each stakeholder and their role will be listed with their potential interest in this project.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Interest</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States Army Corp of Engineers (USACE)</td>
<td>Permitting for construction and any development in water identified as the nation's navigable waters.</td>
<td>Construction effects like pipeline development, dredge, fill, or briny water discharge.</td>
</tr>
<tr>
<td>National Oceanic and Atmospheric Administration (NOAA)</td>
<td>Protect marine mammals and anadromous species including marine ecosystems.</td>
<td>Impacts to the surrounding ecosystem and water quality surrounding the areas of use for intake and outtake pipes.</td>
</tr>
<tr>
<td>United State Fish &amp; Wildlife</td>
<td>The protection of other species not listed as endangered or threatened in the state of California.</td>
<td>Effects on species and the habitats they reside from any part of the project.</td>
</tr>
<tr>
<td>State Agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>County of San Luis Obispo</td>
<td>Any advancements of the county and economic development.</td>
<td>Main role to maintain control and ensure all permit and project approvals as the lead agency.</td>
</tr>
<tr>
<td>California Department of Fish and Wildlife (CDFW)</td>
<td>Protection for all biological resources including special listed species and their habitats.</td>
<td>Impacts to any natural habitats and the species that reside in or around them.</td>
</tr>
<tr>
<td>California State Parks</td>
<td>Protection of Oceano Dunes SVRA and the potential impacts from the project.</td>
<td>The effects the intake and outtake pipelines going through the dunes and the short term and long-term impacts.</td>
</tr>
<tr>
<td>California Department of Transportation</td>
<td>To ensure proper control and management of the transportation and road access aspect of the project.</td>
<td>Access to the project site from highway 1 and transportation of all project needs.</td>
</tr>
<tr>
<td>California Coastal Commission (CCC)</td>
<td>Protection on any portion of the defined California Coastal Zone.</td>
<td>Protect coastal habitats including plant and animal species and water quality.</td>
</tr>
</tbody>
</table>
Nipomo Mesa Desalination Plant Project

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Interest</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Water Resources Control Board</td>
<td>The protection of California water resources. Uses include purification and sustainable usage.</td>
<td>The project meets all regulations when procuring and producing freshwater.</td>
</tr>
<tr>
<td>California State Lands Commission</td>
<td>Access and rights to develop on public lands.</td>
<td>Ensure proper installation of underwater intake and outtake pipes.</td>
</tr>
<tr>
<td>Local Agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central Coast Economic Recovery Initiative</td>
<td>To ensure goals involved with environmental and economic preservation and development.</td>
<td>Invest in the long term uses of the environment and maintain economic standing of the county.</td>
</tr>
<tr>
<td>Cal Poly Institute for Climate Leadership</td>
<td>To ensure the economic development that aligns with the project and the advancement that come with it and the adaptation to climate changes.</td>
<td>Provide current research that goes along with the development of the project and the impacts that result from the project.</td>
</tr>
<tr>
<td>Oceano Economic Development Council</td>
<td>Economy of Oceano and the preservation of its resources.</td>
<td>Involved in the aspect of the project that will advance the economy of Oceano and the protection of specific resources.</td>
</tr>
<tr>
<td>Northern Chumash Tribal Council</td>
<td>Concern with any cultural and archeological resources within or around the project site</td>
<td>Ensure the rights to cultural sites within or around project location.</td>
</tr>
</tbody>
</table>
Nipomo Mesa Desalination Plant Project

3. Environmental Constraints Analysis

3.1. Methodology

Analysis was performed through the use of literature review based on documents like Environmental Impact Reports that have been produced for similar projects within a short proximity of the area of the current project or regulatory documents. No surveys were conducted for this Environmental Constraints Analysis. Research included any criteria impacts directly outlined by CEQA in Appendix G. Appendix G outlines were used to identify the potentially significant impacts for various resources that reside within and around the project area. The project area includes a central area where the main activities will be conducted and those used to access the main project area, which includes the installation or use of pipelines and any major/minor roads and highways. In addition to identifying the significant impacts, Appendix G was also used to identify of any additional documentation or surveys were needed for the interim of the project. Other resource areas will need to be observed outside of this document before proceeding with this project. The resource areas in this document include:

- Air Quality
- Hydrology and Water Quality
- Cultural and Tribal Cultural Resources
- Biological Resources

The resources not included in this document:

- Agriculture and Forestry Resources
- Geology, Soils, and Mineral Resources
- Hazards and Hazardous Materials
- Land Use and Planning
- Noise
- Public Services and Recreation
- Traffic and Transportation
- Utilities and Service Systems
- Energy

Each resource area has been separated into its own section with an overview of the project site in relation to the issue, an analysis of each appendix G question that CEQA will evaluate for this project, all potential constraints, and possible recommendations as a result of the constraints and impacts. In section 4 of this document will be further evaluation of any permits that may be
Nipomo Mesa Desalination Plant Project

required as the result of any project impacts, who may be requiring them, and any associated agencies involved in the process for each permit.

3.2. Air Quality

1.1.17. Issue Area Description

This section describes the emissions and air pollution associated with the Nipomo Mesa Desalination Plant Project. Air pollution is a significant consideration in any project and is particularly notable when a project includes an industrial land designation. For the Nipomo Mesa Desalination Plant Project, the air quality issue area is composed of two phases: the air quality considerations during construction and project development, and the air quality considerations during the lifetime operation of the desalination plant.

Within the county, there are three distinct regions, whose air quality differs significantly. The Nipomo Mesa Desalination Plant Project is considered part of the Coastal Plateau region, a region that encompasses more people and development than the other two regions (Upper Salinas River Valley and East County Plains). As a result of this higher population density, industry, and development, air quality tends to be worse in this region than the other two.11 Figure 6 shows the Air Quality Index (AQI) throughout a 24-hour period from the San Luis Obispo Roberts monitoring station in the city of San Luis Obispo, while Figure 7 shows the AQI throughout a 24-hour period from the Nipomo Regional Park monitoring station at the Nipomo Mesa, located roughly 5 miles from the proposed project site.12

The air quality in the region is monitored and managed by the South-Central Coast Basinwide Air Pollution Control Council and the San Luis Obispo County Air Pollution Control District (SLOCAPCD). While the closest SLOCAPCD monitoring stations are in Arroyo Grande, they only measure particulate matter, or PM$_{10}$ and PM$_{2.5}$. Therefore, the Nipomo Regional Park monitoring station, located roughly 5 miles east of the project site, will be used for any environmental constraints' analysis to ensure a full suite of measurements. Air pollutants are continuously measured and subsequently averaged each hour, 24 hours a day. Figure 8 shows the location of the project site and

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SLOCAPCD monitoring stations located within South Central Coast Air Basin. No sensitive receptors are located within 500 ft of the proposed project location. The nearest sensitive receptor, an elementary school, is located roughly two miles north of the site.

Figure 6: Average Air Quality Index (AQI) for each hour at the San Luis Obispo Roberto Monitoring Station from 7:00 PM April 25, 2021 and 6:00 PM April 26, 2021

Figure 7: Average Air Quality Index (AQI) for each hour at the Nipomo Regional Park Monitoring Station from 7:00 PM April 25, 2021 and 6:00 PM April 26, 2021

14 San Luis Obispo County Air Pollution Control District, EPA, https://airnow.gov
15 San Luis Obispo County Air Pollution Control District, EPA, https://airnow.gov
Nipomo Mesa Desalination Plant Project

Figure 8: Project site, SLOCAPCD monitoring sites, county lines, and air basins

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California Air Resources Board, https://arb.ca.gov
1.1.18. Regulatory Setting

**Federal laws and Regulations**

**Federal and California Clean Air Act:** These pieces of legislation regulate airborne pollutants with oversight from the United States Environmental Protection Agency (USEPA) federally.

**State Laws and Regulations**

**California Air Resources Board (CARB):** At the state level, the California Air and Resources Board (CARB) includes both state and national standards that have been established for all locally relevant ambient pollutants including ozone, particulate matter, nitrogen dioxide, sulfur dioxide, and carbon monoxide. These standards can be found in Table 3.

**Regional Regulation**

**San Luis Obispo County Air Pollutant Control Board:** The San Luis Obispo County Air Pollutant Control Board (SLOAPCD) lists several pollutants of local concern. These include ozone, particulate matter, nitrogen dioxide, sulfur dioxide, and carbon monoxide. The county is currently attaining all standards for pollutants listed under the National Ambient Air Quality Standards, with the exception of ozone. The EPA designated the eastern portion of the county in partial non-attainment in 2018 after lowering the standard. The eastern portion of the county is a designated non-attainment area for 1-hour and 8-hour ozone standards, as well as the 24-hour and annual PM$_{10}$ standards set by the California Ambient Air Quality Standards. However, the county is in attainment of the same standard for annual PM$_{2.5}$ pollutants.

**The Clean Air Plan (CAP):** Updated by SLOAPCD in 2001, the CAP guides development in the region with respect to air quality. The primary pollutants that are addressed by the SLOAPCDs CAP include NOx and reactive organic gasses (ROGs). Both of these criteria pollutants are precursors for the formation of ozone. The current CAP requires industrial and commercial operations to implement vapor recovery to

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Nipomo Mesa Desalination Plant Project

capture and recover pollutants prior to their release into the atmosphere.\textsuperscript{19} The district is also at risk of non-attainment for particulate emissions of Particulate Matter, which come in the form of PM\textsubscript{10} or PM\textsubscript{2.5}.

**The Stipulated Order of Abatement (SOA):** Filed by the SLOAPCD in 2018. This order was filed with regards to the alleged nuisances from particulate matter emissions from the ODSVRA near the project site. The SOA includes a Particulate Matter Reduction Plan (PMRP) that would need to be complied with by any new development in the region.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>United States Standard</th>
<th>California Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone</td>
<td>0.075 ppm (8 hr avg.)</td>
<td>0.07 ppm (8 hr avg.)</td>
</tr>
<tr>
<td>PM10</td>
<td>150 µg/m\textsuperscript{3} (24 hr avg.)</td>
<td>50 µg/m\textsuperscript{3} (24 hr avg.)</td>
</tr>
<tr>
<td>PM2.5</td>
<td>15 µg/m\textsuperscript{3} (24 hr avg.)</td>
<td>12 µg/m\textsuperscript{3} (24 hr avg.)</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>0.053 ppm (annual mean)</td>
<td>0.03 ppm (annual mean)</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>0.04 ppm (24 hr avg.)</td>
<td>0.04 ppm (24 hr avg.)</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>9.0 ppm (8 hr avg.)</td>
<td>9.0 ppm (8 hr avg.)</td>
</tr>
</tbody>
</table>

The South County and Nipomo Mesa areas have historically bad air pollution with respect to particulate matter, as discussed above. This is largely due to the close proximity to the Pismo ODSVRA, which kicks up quite a bit of dust. Likewise, much of the development in the area is found on loose sands and soils, which significantly worsens any PM emissions from activities such as construction.\textsuperscript{21}

1.1.19. **Potential Environmental Constraints and Recommendations**

There are a number of potential environmental constraints associated with air quality for the Nipomo Mesa Desalination Plant Project. All analyses refer to the medium (50 million gallons per day) plant size option discussed in the project description and are


\textsuperscript{20} San Luis Obispo Air Pollution Control District. 2019

based upon analyses from similarly sized desalination plant projects.\textsuperscript{22,23,24} It’s important to note that all estimates and research comes from projects that include distribution pipeline construction and operation. The scope and extent of distribution pipelines for this project is unknown at this time. Due to the present lack of specificity regarding facility design and construction, estimates are extremely approximate. We recommend more extensive study when more project specifics are available. Table 4 below details the potential environmental constraints and respective recommendations for the CEQA Appendix G air quality questions.

<table>
<thead>
<tr>
<th>Thresholds of Significance - Would the project:</th>
<th>Potential Constraints</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conflict with or obstruct implementation of the applicable air quality plan?</td>
<td>Based upon worst-case estimates from similarly sized desalination plants.\textsuperscript{25,26} it isn’t likely that the project would conflict with any relevant current air quality plans, including the CAP, General Plan, or any federal air quality legislation in the long term.</td>
<td>We recommend extensive study and modeling of emissions associated with construction and operation to determine if there is any evidence to suggest non-compliance with any area plans. Particular attention should be paid PM\textsubscript{10} and NO\textsubscript{x} emissions, though no long-term effects are anticipated.</td>
</tr>
<tr>
<td>Violate any air quality standard or contribute substantially to an existing or projected air quality violation?</td>
<td>The emissions associated with 5 of the 6 criteria pollutants is expected to be below the applicable air quality standards. Though the NO\textsubscript{x} emissions during the construction phase of the project would likely exceed air quality standards, it would be temporary. All operational emissions would be well below air</td>
<td>We recommend further study of likely emissions during construction after design is completed. We recommend the adoption of the applicable number and type of mitigation measures during construction phase of project, including</td>
</tr>
</tbody>
</table>


### Thresholds of Significance - Would the project:

<table>
<thead>
<tr>
<th>Potential Constraints</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violate any air quality standard or contribute substantially to an existing or projected air quality violation?</td>
<td>quality standards according to worst-case estimates from similar projects.(^{27})</td>
</tr>
<tr>
<td>Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?</td>
<td>The project area is in an area of non-attainment for particulate matter. The construction process has the potential to increase PM(_{10}) emissions, though only temporarily. Due to the unique particulate matter climate of the southern portion of the county, a cumulatively considerable net increase could occur if no mitigation measures are implemented. Though the eastern portion of the county is in non-attainment for ozone, the area that includes the project area is in attainment.</td>
</tr>
<tr>
<td>Expose sensitive receptors to</td>
<td>Because the project is a desalination plant that would not directly emit any toxic pollutants, it has no potential to expose sensitive receptors to toxic pollution.</td>
</tr>
</tbody>
</table>


Nipomo Mesa Desalination Plant Project

<table>
<thead>
<tr>
<th>Thresholds of Significance - Would the project:</th>
<th>Potential Constraints</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>substantial pollutant concentrations?</td>
<td>expose sensitive receptors to substantial concentrations of pollutants.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Additionally, there are no sensitive receptors within 500 ft of the site.</td>
<td></td>
</tr>
<tr>
<td>Create objectionable odors affecting a substantial number of people?</td>
<td>The project does not have any substantial odor-producing sources.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Question 1:** Will the project conflict with or obstruct implementation of the applicable air quality plan?

The San Luis Obispo County Clean Air Plan (CAP) outlines long-term air quality standards with which all projects must comply. Notable direct emissions generated during plant operation come from employee vehicles and truck trips for maintenance and operation. The equipment utilized for plant operation such as pumps, cleaning equipment, reverse osmosis systems, and more will likely be powered by electricity purchased from the grid and therefore will not contribute directly to air emissions associated with the project’s operation. With respect to the long-term operation of the desalination plant, it’s unlikely that any direct sources of air emissions will be considered potentially significant and warrant mitigation measures. Even when analyzing the most significant estimates for a desalination plant of similar size compared with the most restrictive thresholds of significance, direct sources associated with operation of the plant are well below the standards. Regardless, we recommend further study into operational emissions associated with the plant when more specifics regarding plant size, design, and pipeline construction are known. This will assist in determining what, if any, mitigation measures are necessary with respect to the operation of the plant in accordance with all relevant air quality plans.

The long-term consideration of energy consumption, an indirect source of air emissions, is notable, however. At this point, it is assumed that the plant’s day-to-day operation will be powered by energy purchased from the grid. This indicates that the plant will run largely on fossil fuels, which leads to relatively high emissions, especially when
compared to only direct emissions of plant operation, as generalized from similar project analyses.\textsuperscript{33} Because the power station likely has enough power to supply the desalination plant without exceeding its permitted capacity, these impacts are likely less than significant by the standards of CEQA, but there are alternatives to this power supply that significantly decrease emissions. Most notably, it may be feasible to create on-site power through the installation of solar panels. There are possible limitations, whether they be financial, technical, or other, but we recommend further exploration of the possibility of an onsite, renewable energy source such as a solar farm. While it would lead to an increase in construction related emissions, offsetting the emissions of grid energy would likely decrease long-term air emissions.

Question 2:

Will the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

With respect to the violation of air quality standards, there are multiple potential environmental constraints during the construction and operation phases of the project. Again, further study and analysis is highly recommended after more specifics regarding plant design and construction are determined.

During the construction phase, there are emissions associated with structure demolition, heavy equipment exhaust, delivery truck emissions, employee transportation emissions, and fugitive dust from site grading and earthmoving.\textsuperscript{34} The SLOCAPCD have established construction thresholds for both ozone precursors (ROG + NO\textsubscript{x}) as well as PM\textsubscript{10}, which are the two most problematic pollutants in the area. For ozone precursors, the threshold of significance is a combined 137 pounds daily. PM\textsubscript{10} does not have a daily threshold but maintains a threshold of significance of 2.5 square tons quarterly. Projects with grading areas larger than 4 acres are more likely to exceed the threshold for PM\textsubscript{10}.\textsuperscript{35} It’s fairly likely that the ozone precursor (ROG + NO\textsubscript{x}) standard for construction of 137 pounds per day will be surpassed due to the high NO\textsubscript{x} emissions generated by heavy construction equipment. Based upon the thresholds of significance and estimates from similar projects,


it’s not expected that any of other the criteria pollutants will exceed thresholds. Due to
the temporary nature of NOx emissions as a part of the construction process, it’s likely
that these air quality impacts due to construction are deemed less than significant
according to CEQA criteria.\textsuperscript{36}

There are several mitigation measures that may need to be adopted during the
construction phase. Because the project site is located within SLOCAPCD’s designated
CDF zone, the South County Particulate Matter Expanded Measures must be adopted,
regardless of compliance with air quality standards. If NOx emissions surpass 137 pounds
per day, which is likely, SLOCAPCD’s Standard Mitigation Measures for Construction
Equipment may need to be adopted, even though the temporary emissions may not
warrant potentially significant impacts.\textsuperscript{37}

The operational phase of the project has significantly fewer impacts with regards to air
quality. It’s extremely unlikely that the long-term operations of the desalination plant will
result in any significant impacts.\textsuperscript{38} 39 We recommend a projection of the associated
emissions when more project information is available, but it’s unlikely that any
mitigation measures will need to be adopted, assuming the implementation of fairly
standard plant operations.

\textbf{Question 3:} Will the project result in a cumulatively considerable net increase of any criteria
pollutant for which the project region is non-attainment under an applicable federal or
state ambient air quality standard (including releasing emissions which exceed
quantitative thresholds for ozone precursors)?

San Luis Obispo County is in attainment for all criteria pollutants except for ozone and
PM\textsubscript{10}. However, because the county is only in non-attainment for ozone in the eastern

https://www.carlsbaddesal.com/eir.html

\textsuperscript{37} County of San Luis Obispo Air Quality Control Board. (2012, April). A Guide for Assessing the Air
Quality Impacts for Projects Subject to CEQA Review. 9, May 2021.
https://storage.googleapis.com/slocleanair-
or/images/cms/upload/files/CEQA_Handbook_2012_v2%20%28Updated%20Map2019%29_Linkeddwit
hMemo.pdf

\textsuperscript{38} City of Huntington Beach. (2010, August 23). Seawater Desalination Project. 9 May 2021.
port of the county, the only pollutant not in attainment at the project site is PM\(_{10}\).\(^{40}\) The operation of the plant is unlikely to result in a net increase of any criteria pollutants. Based upon the analyses of other desalination plant projects, the emissions of operation are miniscule in comparison to the thresholds of significance and will therefore not result in a cumulatively considerable net increase. The construction process, however, will see temporary increases in criteria pollutants, namely NO\(_x\) and PM\(_{10}\).\(^{41} 42\) The project area is in attainment for NO\(_x\) levels, so the temporary increase is unlikely to result in a net increase that brings the area to non-attainment. Particulate matter, however, is a significant concern in the area, as discussed in an earlier section. Because the area is in non-attainment, mitigation measures will likely be required to ensure that no cumulatively considerable net increase in PM\(_{10}\) occurs as a result of construction.\(^{43}\)

The project site is located within the SLOCAPCD’s designated Nipomo-CDF forecast zone, which means that the South County Particulate Matter Expanded Measures will need to be implemented during construction. As a result of the county’s non-attainment status for PM\(_{10}\), every construction project must incorporate the Standard List of Fugitive Dust Mitigation Measures. This includes mitigation measures such as covering bare soil, keeping soils wet, monitoring wind, and more. Furthermore, if the project construction area surpasses 4 acres in size, which is likely, the Expanded List of Fugitive Dust Mitigation Measures will need to be adopted. If these mitigation measures are deemed necessary, but still fail to meet thresholds, then more drastic mitigation such as Best Available Control Technology (BACT) for Construction Equipment will need to be utilized, followed by a Construction Activity Management Plan (CAMP), if necessary.

The last level of mitigation measures includes Offsite Mitigation during the construction


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phase. These extreme measures would likely only need to be implemented if NOx emissions are more substantial than anticipated, in addition to PM$_{10}$. 44, 45

**Question 4:**
Will the project expose sensitive receptors to substantial pollutant concentrations?

The project is unlikely to have substantial pollutant concentrations, and therefore will not expose sensitive receptors to harmful pollutants. 46 Furthermore, there are no identified sensitive receptors within 1000 feet of the project.

**Question 5:**
Will the project create objectionable odors affecting a substantial number of people?

The project does not have any odor-generating sources and desalination is not considered to be an odor-generating process according to the South-Central Coast Air Quality Management District. 47

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3.3. Water Quality/Hydrology

1.1.20. Issue Area Description

This section will detail the hydrologic setting of the project site and proposed infrastructure. There are significant potential impacts to hydrologic resources. Primarily due to the briny discharge into the marine environment. Therefore, both terrestrial and aquatic hydrologic systems will be included.

The Nipomo Mesa project site is located two miles inland of the Pacific Ocean in Central California between the ESHA of the Oceano Dunes and a growing residential community. The regional climate is Mediterranean, indicating that there is moderate rain, 16 in per year on average, which primarily occurs in October through May, most often in just a few significant events (Ralph, 2018). The surface water is most often ephemeral and 83% of the regional drinking water is supplied from the Santa Maria Groundwater Basin (Water Agency, 2020). The parcels lie near a watershed boundary but are primarily within the Little Oso Flaco Creek watershed. Little Oso Flaco Creek is an ephemeral freshwater creek. The closest waterbodies of note include Oso Flaco Creek and Oso Flaco Lakes. Figure 9 depicts the hydrologic area surrounding the project site.

The 1,780-acre Santa Maria Refinery is located adjacent to State Highway 1 on the Nipomo Mesa and is situated near the Oceano Dunes Wildlife Preserve. Only about 200 acres are used for company operations while the rest of the property is grazed by cattle, held as open space, or used as a preservation area for wildlife in the Nipomo Dunes.

The offshore marine habitat has qualified for national sanctuary protection since the 1990’s and there is a current effort by the Northern Chumash Tribal Council to establish such a sanctuary that would encompass the proposed intake and return sites. There are two such sanctuaries currently existing in the region. The Monterey Bay National Marine Sanctuary’s southern limit is 45 mi to the north of the project site and the Channel Islands National Marine Sanctuary begins 65 mi to the south. The proposed Chumash Heritage National Marine Sanctuary would connect these two existing sanctuaries. The establishment of such a marine sanctuary would have an impact on the proposed concentrate management operations.

The groundwater basin has been adjudicated for many years with an original judgement in 2008 and amended judgement in 2014 due to conflicting claims to rights of the agricultural interests and landowners with the municipalities (City of Santa Maria v Adam, 2019). The proximity to the coast increases the risk of seawater intrusion into the basin if there is any substantial drawdown of the aquifer.
1.1.21. Regulatory Setting

**Federal laws and Regulations**

The **Clean Water Act (CWA)**: The CWA is a federal act that establishes the basic structure for discharging pollutants into waters and regulates water quality standards. The EPA is charged with enforcement of this act. They are responsible for any permits to discharge any pollutant from a point source into navigable waters. A point source is identified as a discrete conveyance such as a discharge pipeline. The permit required is issued under the National Pollution Discharge Elimination System (NPDES). The EPA has delegated responsibility for enforcement and permitting under the CWA to the State Water Resource Control Board, US Army Corps of Engineers, and regional water quality boards.

*Section 401* requires parties seeking to discharge point source pollutants to obtain a water quality certification verifying compliance with water quality standards. The state in which the discharge originates is responsible for the issuance of the certification. The proposed project is under the jurisdiction of the Central Coast Regional Water Quality Board.

*Section 402* details the requirements for issuance of a NPDES permit. The EPA has established the State of California as responsible for administering and enforcing provisions of the CWA and NPDES. This project would require an NPDES permit due to the proposed use of point-source discharge into the marine system.

*Section 403* requires establishment and periodic review of degradation thresholds for territorial seas, waters of the contiguous zone, or oceans. Any permit provided under the NPDES must be within these thresholds or receive a waiver. The criteria for degradation include threats to human and marine life and marine resource values as well as pollutant persistence and dispersal rates. The current standards established by the administrator should be known prior to applying for any discharge permits.

The EPA also has a separate policy to regulate water quality besides the CWA which is known as the **Anti-Degradation Policy**. States are tasked with developing anti-degradation policies and implementing enforcement. The policy designated three tiers of protection. The first tier is existing uses and represents the minimum protection applied to all waters. The second tier is regarding protection of existing water quality that exceeds the basic needs of current uses. This water quality may not be degraded further than is economically necessary or that still preserves "fishable/swimmable" uses. The final tier is...
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relevant to waters that are deemed an “outstanding national resource.” This tier is the highest level of protection afforded to water bodies.

State Laws and Regulations

The Porter Cologne Water Quality Control Act: This piece of legislation was passed in the state of California to expand its enforcement authority over water bodies. It was established to protect water quality and beneficial uses of water. The act requires projects that are discharging, or proposing to discharge, wastes that could affect the quality of the state’s water to file a waste discharge report with the appropriate Regional Water Quality Board. The act also requires regional water control boards to establish basin-level water quality control plans. The Central Coast Regional Water Quality Control Board is responsible for potentially threatening discharges to water bodies.

A total maximum daily load permit is approved by the Regional Water Quality Control Board, the State Water Resources Control Board and the US Environmental Protection Agency. Once approved, it establishes 1) an allowable amount of a pollutant to a waterbody, 2) proportional responsibility for controlling the pollutant, 3) numeric indicators of water quality, and 4) implementation to achieve the allowable amount of pollutant loading.

Regional Regulation

The Central Coast Stormwater Program: This program regulates stormwater discharges from municipalities and construction and industrial activities, to protect, maintain and improve watershed processes affected by stormwater runoff. A designated stormwater discharge system must be established separately from any municipal systems.
Figure 9: Project site hydrologic setting including ocean depth contours, Oso Flaco Creek, Oso Flaco Lake, and other waterways.

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48 California Department of Fish and Wildlife, https://wildlife.ca.gov
49 County of San Luis Obispo, https://opendata.slocounty.org
Figure 10: Watersheds in the project site parcels\textsuperscript{50}

\textsuperscript{50} County of San Luis Obispo, https://opendata.slocounty.org
1.1.22. Potential Environmental Constraints and Recommendations

The evaluation of potential impacts and thresholds of significance is based on the CEQA Appendix G issue area questions for water quality. These questions guide analysis for environmental impact reports. We are unable to provide definitive impact statements at this time. Potential impacts are therefore provided based on the proposed project description. Recommendations are determined from the regulatory setting and identified potential impacts. Potential impacts and recommendations are summarized below. A subsequent discussion for each relevant threshold is also provided.

Table 5: Potential hydrologic constraints and recommendations

<table>
<thead>
<tr>
<th>Thresholds of Significance</th>
<th>Potential Constraints</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violate any water quality standards or waste discharge requirements?</td>
<td>Return flows to the marine environment would have the potential to significantly alter the properties of the water and ecosystem functions.</td>
<td>Obtain proper NPDES permits. Research feasibility of working with local wastewater treatment plants to reduce concentration on effluent.</td>
</tr>
<tr>
<td>Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit?</td>
<td>The project does not propose to use groundwater in the desalination process or return effluent to the aquifer.</td>
<td>N/A</td>
</tr>
<tr>
<td>Substantially alter the existing drainage pattern of the site or area which would result in substantial erosion or siltation?</td>
<td>The project site has been operated as an industrial facility and no significant expansion of the footprint is proposed. Construction of the intake, return, and distribution pipelines has the potential to temporarily increase sediment runoff.</td>
<td>Revegetate any habitat that is damaged during construction of the intake, return, and distribution lines. Follow all federal, state, and local regulations for construction of temporary roads.</td>
</tr>
<tr>
<td>Substantially alter the existing drainage pattern of the site or area which would substantially increase the rate or amount of surface runoff?</td>
<td>The project site has been operated as an industrial facility and no significant expansion of the footprint is proposed. Construction of the intake, return, and distribution pipelines has the potential to temporarily increase runoff rates and amounts.</td>
<td>Revegetate any habitat that is damaged during construction of the intake, return, and distribution lines. Follow all federal, state, and local regulations for construction of temporary roads.</td>
</tr>
</tbody>
</table>
### Thresholds of Significance

<table>
<thead>
<tr>
<th>Thresholds of Significance</th>
<th>Potential Constraints</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide additional substantial sources of polluted runoff?</td>
<td>There are no known existing or planned stormwater drainage systems of concern. Chemicals used onsite do not represent a substantial source of polluted runoff.</td>
<td>N/A</td>
</tr>
<tr>
<td>Otherwise substantially degrade water quality?</td>
<td>Failure of a discharge pipeline resulting in effluent contaminating coastal ecosystems is possible. Use of treated water to supplement natural flows in the Oso Flaco watershed has the potential to adversely impact native ecosystems.</td>
<td>Follow relevant Federal, State, and Local regulations for construction of the discharge infrastructure. The proposal to use treated water as supplemental flow must be evaluated prior to discharge and the discharge should be continually monitored for quality.</td>
</tr>
<tr>
<td>Place housing within a 100-year flood hazard area?</td>
<td>There is no housing associated with this plan and the project will have no effect on the regional flood risk.</td>
<td>N/A</td>
</tr>
<tr>
<td>Place within a 100-year flood hazard area structure which would impede or redirect flood flows?</td>
<td>The project site is in an area of minimal flood risk according to FEMA.</td>
<td>N/A</td>
</tr>
<tr>
<td>Expose people or structure to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a dam or levee?</td>
<td>The project does not pose the risk of contributing to the collapse of a dam or levee that would expose people or structures to a significant risk of loss, injury, or death.</td>
<td>N/A</td>
</tr>
<tr>
<td>Inundation by seiche, tsunami, or mudflow?</td>
<td>There is no expected potential of increase in the risk of inundation by seiche, tsunami, or mudflow.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

There are several thresholds of significance that will not be met by this project due to lack of effect on housing, the location being in a low flood risk area, and lack of proposed use of groundwater for flow augmentation or discharge. The remaining questions will be addressed in detail below.

**Question 1:**
Will the project violate any water quality standards or waste discharge requirements?

The greatest probable environmental impact to water quality results from the return of briny effluent to the nearshore marine environment. The proposed desalination plant will therefore require strict management of the discharge. This analysis will focus on the submerged disposal method, as detailed in the project description section. The submerged disposal method uses underwater pipes to transport concentrate away from the plant into nearby estuarine or ocean locations. The primary concern with this method is the potential impact of briny concentrate sinking to the ocean floor due to different densities. There are many environmental conditions, such as wave action, tidal action, wind action, and ambient water salinity and temperature, that can have an impact on the magnitude of discharge impacts. Further studies must be done to determine the suitability of the nearby ocean for disposal, including the quality of the discharge and likely time of concentration of the effluent once it is deposited. The plant will require NPDES permits regardless of any findings in addition to filing regular water quality reports with the Central Coast Regional Water Quality Board under the Porter-Cologne Water Quality Act.

**Question 2:**

Will the project substantially alter the existing drainage pattern of the site or area which would result in substantial erosion or siltation?

The project has limited potential for substantially altering the existing siltation or erosion rates due to the consistency with the current site usage and lack of substantial increase of the current infrastructure footprint at the site. The construction and operation of distribution pipelines presents a potential to alter drainage patterns. Focus should be made on revegetating any areas that are affected by pipeline construction (when scope is determined), and all relevant federal, state, and local regulations should be complied with. Any greater determination of potential impacts or recommendations is outside the scope of this report.

**Question 3:**

Will the project substantially alter the existing drainage pattern of the site or area which would substantially increase the rate or amount of surface runoff?

The project has limited potential for substantially altering the existing rates or amounts of surface runoff due to the consistency with the current site usage and lack of substantial increase of the current infrastructure footprint at the site. The construction and operation of distribution pipelines (when scope is determined) presents a potential to alter drainage patterns. Focus should be made on revegetating any areas that are affected by pipeline
construction, and all relevant federal, state, and local regulations should be complied with. Any greater determination of potential impacts or recommendations is outside the scope of this report.

**Question 4:**

Would the project otherwise substantially degrade water quality?

Oso Flaco Creek and the two associated freshwater lakes have been designated as impaired by the Central Coast Department of Water Resources. One of the project objectives is to assist in the preservation of local waterbodies, including Oso Flaco Creek and the associated fresh-water lakes. This ecological restoration might take the form of returning flows of desalinated water to the nearby surface-water bodies. The proposal to use treated water as supplemental flow must be evaluated by a hydrologist and ecologist prior to discharge, and any discharge should be continually monitored for relevant water quality parameters.

The intake, discharge, and distribution pipelines all pose threats to local water quality in the event of a failure. These pipelines must all be constructed following federal, state, and local regulations. There is an increased risk of seismic activity in the area due to proximity to major and minor faults. This should be accounted for during design and construction of all infrastructure, particularly the pipelines.

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51 Clean Water Act Section 303(d) List / 305(b) Report
3.4 Cultural Resources

1.1.23. Issue Area Description

This section outlines resources associated with federally recognized as historically significant or other cultural sites allocated to recognized Native American tribes. This project is located along the Central Californian coast on the Nipomo Mesa, within what is known as the Central Coast Archaeological Region. This region is archeologically sensitive, that extends from areas within San Luis Obispo to Monterey Bay. The project site has observed historical uses by Indigenous groups including multiple Northern Chumash tribes roughly 10,000 years ago. Historical resource includes any objects such as buildings, structures, site, area, place, record, or writing with historical or archeological significance as is outlined in the California Public Resources code (PRC) Article 2 Section 5020.1. Evidence suggests there is a period of time where one central tribe controlled the region closer to Avila, roughly 15 miles North of the project site. Spanish settlements are documented to have begun around the mid to late 18th century within a 30-mile radius of the project area. Studies conclude that within a given 30-mile radius there was roughly 21 mission settlements constructed during that time where evidence remains of its existence. Figure 11 provides a visual of the area of historical Chumash lands in relation to the projected project site.

In California, about 50% of the coastal zone has been designated as archeologically sensitive. Archaeological resources include areas where prehistoric or historic activity measurably altered the earth, and include physical remains (e.g., arrowheads, bottles, or dietary refuse). Areas where potential resources are located can be found closer to the Nipomo Creek and Black Lake Canyon 2.5 miles away from the project site where tribe settlements and uses have been documented (The Docent Project, 1991). Any new construction within the project site, including the undetermined delivery pipelines, would require an evaluation by a professional archeologist and a consultation with Northern Chumash groups for any areas of cultural significance. Cultural resources of the indigenous peoples represent and document the activities, traditions, and accomplishments of past and present cultures of the Chumash inhabitants.

All information on archeological locations and cultural sites are confidential.

1.1.24. Regulatory Setting

State Laws and Regulations

California Regulatory Code § 15064.5: Outlines whether a site is deemed historically significant if it meets the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

Appendix G emphasizes that a project would have a significant impact on cultural resources if the project directly or indirectly destroys a unique paleontological resource or site or unique geologic feature. In addition to CEQA, there are several pieces of legislation that require compliance in order to assess the significance of the project’s impact on the site’s cultural resources. Notably, there are guidelines that must be met as outlined in the National Environmental Preservation Act (NEPA), the National Historic Preservation Act (NHPA), and more. The Nipomo Mesa Desalination Plant Project has the potential to cause direct impacts from construction, landscaping, and operation of the desalination plant. Indirect impacts include erosion, vibration, unauthorized artifact collecting, and vandalism (Phillips Rail Spur Final EIR, 2015). Disturbance of sensitive prehistoric archaeological resources should be discussed with the Native American community before construction begins.

Public Resources Code § 5097.9 and 5097.993 defines a Native American tribe as being a “federally recognized California Native American tribe of a non-federally recognized California Native American tribe that is on the contact list maintained by the Native American Heritage Commission” and “traditional tribal cultural places are defined to include sanctified cemeteries, places of worship, religious or ceremonial sites, or sacred shrines, or any historic, cultural, or sacred site that is listed on or eligible for the CRHR including any historic or prehistoric ruins, burial grounds, or archaeological site (Governor’s Office of Planning and Research 2005:4).”

Assembly Bill 52 Public Resources Code (PRC) amended Section 5097.94 with respect to Native Americans and took effect on July 1, 2015. This law establishes the mandate of consulting with Native American tribes over tribal cultural resources. This consultation must take place and is to be completed before CEQA documents are certified. This process can move through the California Native American Heritage Commission (NAHC).
Senate Bill 18: Requires cities and counties to consult with Native American tribes through land use processes, both public and private, prior to any land use decisions in an effort to protect these resources.

Regional Regulations

General Plan Conservation and Open Space Element CR 4.1-4.5: Maintains and outlines the guidelines to the preserve and protect all Native American, archeological, historical, and paleontological resources that are known. Guidelines outline in CR 4.1-4.5 specify the treatment of such resources and keep a detailed inventory of resources with the consultation with tribal members.

Coastal Zone Land Use Ordinance: Include the requirements to protect known sources and enforces the implementation of mitigation measures where necessary which remain consistent with the California Coastal Act Public Resource Code 30000.

Section 23.04.200 includes protections of archeological resources that are not in archeologically sensitive areas.

Section 23.07.104 includes and defines all archeologically sensitive areas. In addition the section outlines the need for a site survey, mitigation plan outlines, and the discovery of archeological resources.
Nipomo Mesa Desalination Plant Project

Figure 11: Project site location on the Northern Chumash land in San Luis Obispo County, California.
1.1.25. Potential Environmental Constraints and Recommendations

**Table 6: Potential cultural environmental constraints and recommendations**

<table>
<thead>
<tr>
<th>Thresholds of Significance</th>
<th>Potential Impacts</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5?</td>
<td>Considerations of the potential for construction/additions to the desalination plant, such as the construction of new or additional pipelines and the transportation of materials used, could have adverse impacts on historical resources within a certain proximity therefore impacts could be <strong>less than significant with mitigation incorporated</strong>.</td>
<td>It is recommended to coordinate with tribal members after an initial study to identify and resources that can be altered as outlined in PRC SS5097.98.</td>
</tr>
<tr>
<td>Cause a substantial adverse change in the significance of an archeological resource pursuant to section 15064.5?</td>
<td>The Nipomo Mesa is known to have a history of cultural and historical geographical settings making this impact potentially <strong>less than significant with mitigation incorporated</strong>.</td>
<td>It is recommended to coordinate with tribal leaders and members for the potential for adverse impacts after an initial study to identify and resources that can be altered as outlined in PRC SS5097.98.</td>
</tr>
<tr>
<td>Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?</td>
<td>Impacts that are a direct result of the project implementation needs to be considered based on how those impacts can affect nearby paleontological sites which makes these impacts potentially <strong>less than significant with mitigation</strong>.</td>
<td>It is recommended to coordinate with tribal leaders and members for the potential for adverse impacts after an initial study to identify and resources that can be altered as outlined in PRC SS5097.98.</td>
</tr>
<tr>
<td>Disturb any human remains,</td>
<td>There are no known burial sites recorded to be on the project site</td>
<td>It is recommended to coordinate with tribal leaders and members for the potential for adverse impacts after an initial study to identify and resources that can be altered as outlined in PRC SS5097.98.</td>
</tr>
</tbody>
</table>
Nipomo Mesa Desalination Plant Project

<table>
<thead>
<tr>
<th>Thresholds of Significance</th>
<th>Potential Impacts</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>including those interred outside formal cemeteries?</td>
<td>making this impact potentially less than significant.</td>
<td>leaders and members for the potential for adverse impacts. Per PRC section 21083.2, if human remains are found during a survey the lead agency will need to consult the proper tribe identified by the Native American Heritage Commission.</td>
</tr>
</tbody>
</table>

Many of the impacts listed are dependent on the evaluation and determination of significant archeological and cultural/historical sites to be determined by local tribal leaders and archeological surveys. Suggested mitigations will be evaluated based on findings. If there are findings within or around the area to be significant Native American Heritage Commission will need to be consulted as outline in PRC SS5097.98. It is possible for the applicant to develop an agreement with the identified tribe to treat/dispose of the human remains. Because the land allocated for the Phillips 66 Refinery is the land that will be used for this project, it is likely mitigation measures have been determined and mitigation has been conducted for these resources. Should any additional lands allocated for pipelines or transportation needs disturb any of the same or other archeological resources then new mitigation measures will be put in place. All information on the location of these particular sites is completely confidential and a supplemental document many need to be reviewed after a survey is conducted\(^{53}\). If remains are found the project proponent can expect to halt all operations within the area and being the proper steps by getting in contact with the NAHC to identify the tribe the remains belong to so that the proper burial preparations can be made by the tribe. If findings are identified outlined in PRC section 21082 the lead agency needs to be consulted to make proper provisions of the findings. These include surveys by a qualified archeologist if there are findings observed then proper actions should be taken to mitigate.

**Question 1:**

Causes a substantial adverse change in the significance of a historical resource as defined in section 15064.5?

Project boundaries reside within the property for the Phillips 66 refinery, and this project is using land that was once allocated for other industrial use will have considered the cultural resources that reside at or near the project site. With the hauling to and from construction sites, there could be the addition of territory where resources reside.

**Question 2:**

| Cause a substantial adverse change in the significance of an archeological resource pursuant to section 15064.5? |

Section 15064.5 states that the lead agency can determine an area as historically significant due to any presences of a historical or cultural setting.

**Question 3:**

| Directly or indirectly destroy a unique paleontological resource or site or unique geological feature? |

Section 15064.5 states that the lead agency can determine an area as historically significant due to any presences of a historical or cultural setting. It is necessary to assess the potential impacts of nearby resources.

**Question 4:**

| Disturb any human remains, including those interred outside formal cemeteries? |

There are no recorded or known burial sites near the project site. Regardless, we recommend a consultation with local tribes for the potential of burial sites that might be off site from the Phillips refinery site this proposed project could potentially run into.

### 3.5. Biological Resources

**1.1.26. Issue Area Description**

This section discusses the potential effects on biological resources that would result from the Nipomo Mesa Desalination Plant Project. According to CEQA Appendix G, this issue area contains sub-issue areas including adverse effects such as: special status species, riparian habitat, federally protected wetlands, wildfire corridors, ordinances protecting resources, and conservation plans. These sub-issues are addressed in the baseline environmental conditions section. Many potential impacts to biological resources on the project site will likely be mitigated by the continuity of industrial land use on the parcel from the previous operator to the current proposal. Any rehabilitation activities will require biological surveys by a certified professional or organization. Finally, the effect
Nipomo Mesa Desalination Plant Project

of discharging briny effluent on the marine habitat must be further examined by a certified professional or agency due to the complex nature of interactions and lack of specific data about the discharge.

The baseline environmental data for biological resources was found from similar projects applicable research in the Nipomo Mesa Area. Contributing document data has come from the Nipomo Community Services District, the City of Arroyo Grande, and the California Coastal Commission.

ESHA includes vegetation communities that are considered sensitive natural communities by the California Department of Fish and Wildlife (CDFW), that are subject to regulation under the Clean Water Act, the State’s Porter Cologne Act, or California Fish and Game Code. This project exists within ESHA boundaries and is subject to the applicable environmental regulations provided by the CDFW.

Vegetation and Plant Communities

Vegetation

The vegetation community types that exist within the Nipomo-Mesa area is open-space, sand dunes, dune scrub, vegetation islands, dune lakes, freshwater streams, coastal lagoons, wetlands, riparian habitats, and woodlands. Riparian communities are those found near streams and other water bodies. There are two zones of beach dunes: foredunes and back dunes. These zones are sparsely vegetated with low-growing plants with deep root systems. The strong winds, storm waves, salt spray, dearth of freshwater, and nutrient-poor substrate make it the establishment of vegetation difficult. The sandy beach is considered a harsh environment where most surrounding plants are unlikely to survive. The Pismo State Beach and the Oceano Dunes, along with the wildlife and vegetation, are protected by the Habitat Conservation Plan (HCP) under the Federal Endangered Species Act (AECOM).

2500 acres of the project area, or 50%, is covered by sand. Sand covered zones are generally too harsh to host vegetation due to the temperature and salinity. Vegetation in the project zone is found on the Pismo back dunes, wetlands, and woodlands. However, vegetation within the woodland areas of the project zone is generally non-endemic: eucalyptus (Eucalyptus rostrata) and the Monterey pine (Pinus radiata). Among the endemic tree species is the coast live oak (Quercus agrifolia). There is approximately 1814 acres of native vegetation, compared to 534 acres of non-native vegetation within the project area.

Open Space

Parts of the Nipomo Dunes are designated per the South County Area Plan as Open Space land use (San Luis Obispo County). These open space land uses are intended to serve as a buffer area from off road vehicular use in the Oceano Dunes SVRA, for vegetation protection to the dune vegetation and wetlands. The Oceano Dunes serve as a habitat to a multitude of plants.
Nipomo Mesa Desalination Plant Project

and animal species, some of which are exclusive to the dune biotic community. The dunes are considered iconic among California’s many natural formations.

Plant Communities

The project site is situated on a parcel of land which is surrounded by Biological Significant Areas which are “worthy of preservation, protection, and restoration (CDFW). Species and critical habitats have the potential to be threatened with the production of the Nipomo Mesa Desalination Project. Habitats that were considered significant included Coyote Brush Series, Alluvial Scrub, Riverbed, California Annual Grassland Series, Eucalyptus Series, Agricultural, Ornamental, Developed and Ruderal habitats.

Threatened Species and Sensitive Habitats

There are sensitive plant species and habitats the exist within the project area and are at risk of being impacted. These sensitive vegetative communities include the Central Dune Scrub, Central Foredunes, Central Maritime Chaparral, Costal Freshwater Marsh, Valley Freshwater Marsh, Southern Vernal Pool, and Valley Needlegrass Grassland (MRS).

The Oceano Dunes District Habitat Conservation Plan (HCP) specifies Avoidance and Mitigation Measures (AMM) to protect covered special status plants in the HCP area. The AMM would pertain to the construction of the pipeline which runs from the ocean to the desalination plant. Habitat types in within the Oceano Dunes include open sand, foredunes, Central Coast dune scrub, dune lakes, freshwater creeks, coastal lagoons, wetlands, riparian habitats, woodlands, and vegetated islands. The project area is considered suitable habitat for species listed as rare, threatened, or endangered. The Biological Resource Assessment (BRA) survey determined that rare plants that occur in coastal dune systems throughout the Central Coast were not present in this particular habitat because of unsuitable condition stated above (SLO County).

There are 27 special status plant species in or adjacent to the Oceano Dunes. Plants are characterized as special status species if they are listed pursuant to the California Endangered Species Act (CESA), the Federal Endangered Species Act (ESA), or assigned by the California Native Plant Society (CNPS). Of the 27 special status plants, 6 are listed as Threatened or Endangered: marsh sandwort (Arenaria paludicola), the State LaGraciosa thistle (Crisium scariosum), Gambel’s watercress (Nasturtium gambelii), beach spectacle pod (Dithyrea maritima), Nipomo Mesa lupine (Lupinus nipemensis), and surf thistle (Circium rhophophilum). The environmentally sensitive habitats are valuable for the roles that they play in maintaining the ecosystem.

The La Graciosa thistle is a federally endangered, state threatened species. This species is a perennial herb that blooms in the summertime. This species is found in coastal dunes, riparian scrub, lake edges, riverbanks, or other wetlands. This species is endemic to San Luis Obispo and Santa Barbara Counties.
### Table 7: Federally listed plant species

<table>
<thead>
<tr>
<th>Plant Species</th>
<th>Scientific Class</th>
<th>Federal Status</th>
<th>Habitat Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marsh sandwort <em>Arenaria paludicola</em></td>
<td>Dicotyledons</td>
<td>Endangered</td>
<td>Known to occur in marshes, swamps and areas that are wet year-round; the natural population exists that the Oso Flaco Lake, introduction of the plant to similar areas has failed.</td>
</tr>
<tr>
<td>State LaGraciosa thistle <em>Cristium scariosum</em></td>
<td>Dicotyledons</td>
<td>Threatened</td>
<td>Has only been found on the coast of southern San Luis Obispo and northern Santa Barbara counties, and grows in riparian habitat, often around seeps or in marshes.</td>
</tr>
<tr>
<td>Gambel's watercress <em>Nasturtium gambelii</em></td>
<td>Dicotyledons</td>
<td>Threatened</td>
<td>Occurs in interior wetlands and coastal wetlands of San Luis Obispo; grows in fresh and brackish waters, such as lakesides and marshes.</td>
</tr>
<tr>
<td>Beach Spectacle Pod <em>Dithyrea maritima</em></td>
<td>Dicotyledons</td>
<td>Threatened</td>
<td>Found near seashores and coastal sand dunes</td>
</tr>
<tr>
<td>Nipomo Mesa Lupine <em>Lupinus nipmensis</em></td>
<td>Dicotyledons</td>
<td>Endangered</td>
<td>Occurs in areas with beaches and sand dunes that are derived from sand deposits that are less than 2.6 million years old; particular to the Guadalupe and Oceano sand dunes.</td>
</tr>
<tr>
<td>Surf Thistle <em>Circium rhothophilum</em></td>
<td>Dicotyledons</td>
<td>Threatened</td>
<td>Endemic to California, where it is known only from the coastline around the border between San Luis Obispo and Santa Barbara Counties. It grows in sand dunes and coastal scrub near the beach.</td>
</tr>
</tbody>
</table>

Under the Federal Endangered Species Act, there are 6 species that exist within the project area listed as threatened or endangered that have the potential to be impacted by the Nipomo Mesa Desalination Plant Project.
Riparian communities are integral for many wildlife species because there is an abundance of moisture and associated vegetative structure, materials, and food for nesting animals. Many species use riparian areas as cover or as corridor for movement.

The Biodiversity Management Plan Area (BMP) consists of the entirety of the Oceano Dunes State Vehicular Recreation Area (ODSVRA), parts of Pismo State Beach (PSB) south of Grand Avenue, is all located within the boundaries of San Luis Obispo County. The total area is 370 acres of riparian habitat, Arroyo Willow Thicket, in association with the major water bodies, including the Oceano Lagoon and Oso Flaco Lake, as well as many other small, isolated wetlands within the dune’s complex. Approximately 135 acres has been classified as native wetland alliances and 70 were open water habitat, namely Oso Flaco. These riparian and native wetland areas are protected areas, shown in Figure 12. All trimming and management of riparian vegetation is conducted consistent with a Streambed Alteration Agreement issued by the CDFW.

Wetlands are areas where the soil is saturated with water for a certain portion of the year. There are multiple types of wetlands that are present in and relevant to the Nipomo Mesa Desalination Plant Project including dune lakes, aquatic beds, wetted areas with and without vegetation, marshes, swamps, and mudflats (MIG). Wetlands are protected by the EPA, US Army Corps, and the United States Geological Survey (USGS) at a federal level, as well as protection, permitting, and other regulations by agencies at the state and county level (Table 10).

Wetlands that occur within the project area include the ten dune lakes to the south and east of the Pismo Dune Natural Preserve. These are freshwater lakes with surrounding native and introduced vegetative cover. The plant cover primarily consists of dense aquatic and semiaquatic. They support the marsh and riparian communities and serve as a seasonal habitat for migrating birds. Damage to this area results in the disruption of breeding by the migratory birds (San Luis Obispo County General Plan).

The two Oso Flaco Lakes function as support to freshwater marshes, riparian vegetation, and coastal sage scrub. Oso Flaco Lake is also a seasonal spot for migratory birds to rest.

The Santa Maria River runs through 35 acres in San Luis Obispo and Santa Barbara counties. The Santa Maria River is not directly influenced by the proposed project. Conscious construction practices will keep the potential of negative impacts to less than significant regarding wetlands and respective habitats.

For future projects proposed in the Oso Flaco Lake area, CDFW recommends that avoidance of impacts to special status plants, especially those which impact and influence the biodiversity of the lake, such as the gambel’s watercress. These impacts include actions which would alter the hydrological regime, degradation of habitat, and hybridization with the widespread and invasive common water cress.
Figure 12: Project site in relation to wetlands, riparian ecosystems, and waterways
Common Wildlife

The Oceano Dunes has an abundant ecosystem and is home to a variety of saltwater and freshwater fish, reptiles and amphibians, birds, mammals, and invertebrates. There are at least 19 species of fish, 28 species of reptiles and amphibians, 19 species of mammals, and numerous bird species located in the area. The active dunes are a common habitat for animals who use the sand areas for nesting and migration.

There are endangered or threatened species located within, or in close proximity to, the Nipomo Mesa Desalination Project. These animals are listed by the Ecological Services Program of the U.S Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA Fisheries). The animals in question include the Western Snowy Plover (Charadrius nivosus nivosus), California Least Tern (Sterna antillarum browni), California Red Legged Frog (Rana draytonii), Western Pond Turtle (Actinemys marmorata), Western Spadefoot Toad (Spea hammondii), Tidewater Goby (Eucyclogobius newberryi), and Steelhead Trout (Oncorhynchus mykiss). Specific endangered or threatened species are explained in detail below.

Nesting Birds

The Western Snowy Plover (Charadrius nivosus nivosus) are small, light colored ground-nesting shorebirds with long legs and a short neck. They are threatened species in the Nipomo Mesa and will likely be endangered in the foreseeable future. Location of the snowy plover is shown in Figure 13. The snowy plover population at the Oceano Dunes contain resident birds, present year-round, and partly of migrant birds, present only during the breeding or wintering season. The California Least Tern (Sterna antillarum browni) also reside near the Nipomo Mesa and are an endangered species reported from the U.S Fish and Wildlife Service. They have long, narrow wings and a broad, forked tail. The snowy plover and the least tern depend on fish caught on the surface of the ocean and nearby lakes. Due to these birds being threatened and endangered species, critical management must take place for their protection. The proposed desalination project has the potential to harm the bird's sensitive habitat by construction and noise.

Aquatic Species


Steelhead Trout (*Oncorhynchus mykiss*) is identified as a threatened species by the National Oceanic and Atmospheric Administration (NOAA Fisheries). They are a unique species that hatch in gravel-bottomed, fast-flowing, well-oxygenated rivers and streams. Steelhead trout complete their life cycle in both freshwater and ocean systems, living in freshwater for one to three years before migrating to the ocean. Steelhead are located along California's coast, as seen in Figure 13. Steelhead reside in Arroyo Grande Creek and Pismo Creek, which are the only two creeks in near the project site that are connected to the ocean for steelhead migration. Arroyo Grande Creek has been identified by the National Oceanic and Atmospheric Administration (NOAA) and the National Marine Fisheries Service (NMFS) as critical habitat for the recovery of the steelhead (California Department of Fish and Wildlife, 2021).

Steelhead have the potential to be impacted during the construction of the desalination plant. It is essential to create mitigation measures to ensure the steelhead can migrate safely within the project site.

Tidewater Goby (*Eucyclogobius newberryi*) are listed as an endangered species by the U.S Fish and Wildlife Service. The tidewater goby is tolerant to a variety of salinities and have no explicit marine life stage, but research suggest that they do disperse intermittently into the ocean (California Department of Fish and Wildlife, 2021). Their reproduction occurs during late spring and early autumn, which is during the time that the Arroyo Grande Creek ocean outlet is closed. Tidewater goby are in both the Arroyo Grande Creek and/or the Arroyo Grande Creek lagoon during their reproduction stages (California Department of Fish and Wildlife, 2021). Production for the Nipomo Mesa Desalination Plant project would need to create mitigation measures to not disrupt this endangered species.

The California Red-legged frog (*Rana draytonii*), as seen in Table 8, is listed as a threatened species by the U.S Fish and Wildlife Service. The red-legged frog is located within close proximity to the project site. All life stages of the red-legged frog from tadpoles, juveniles, and adults have been found in the Arroyo Grande Creek Estuary, which is listed as critical habitat (California Department of Fish and Wildlife, 2021).

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### Table 8: Federally listed animal species

<table>
<thead>
<tr>
<th>Animal Species</th>
<th>Species Class</th>
<th>Federal Status</th>
<th>Habitat Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pallid bat \textit{Antrozous pallidus}</td>
<td>Mammalia</td>
<td>Endangered</td>
<td>Pallid bats were detected during passive acoustic surveys at Oceano Lagoon in June 2017.</td>
</tr>
<tr>
<td>California Clapper Rail \textit{Rallus longirostris obsoletus}</td>
<td>Aves</td>
<td>Endangered</td>
<td>Historically present and known to breed at Oso Flaco Lake. Not observed since 1991. Suitable foraging, nesting, and roosting habitat may include Oso Flaco Lake, Little Oso Flaco Lake, and Pismo Lake.</td>
</tr>
<tr>
<td>California Least Tern \textit{Sterna antillarum browni}</td>
<td>Aves</td>
<td>Endangered</td>
<td>Nests along the beach. Most commonly observed foraging over the ocean, though they are regularly observed foraging at Oso Flaco Lake and Pismo Lake, as well as at the small lagoon that forms at the mouth of Pismo Creek.</td>
</tr>
<tr>
<td>Marbled Murrelet \textit{Brachyramphus marmoratus}</td>
<td>Aves</td>
<td>Threatened</td>
<td>Outside the known breeding range. Suitable foraging habitat within site area is located offshore and at Pismo Lake, Pismo Lagoon, Oceano Lagoon, and at the mouths of Pismo Creek, Arroyo Grande Creek, and Oso Flaco Creek.</td>
</tr>
<tr>
<td>Western Snowy Plover \textit{Charadrius nivosus nivosus}</td>
<td>Aves</td>
<td>Threatened</td>
<td>Nests and forages in habitat along the beach and foredunes. Winters in the site area.</td>
</tr>
<tr>
<td>Willow Flycatcher \textit{Empidonax traillii}</td>
<td>Aves</td>
<td>Endangered</td>
<td>Outside the known breeding range. Observed at Oso Flaco Lake and at Oceano Lagoon as recently as 2016.</td>
</tr>
<tr>
<td>Coast Range Newt \textit{Taricha torosa}</td>
<td>Amphibian</td>
<td>Endangered</td>
<td>Infrequently observed in the site area within or near aquatic habitat. Suitable habitat for this species is limited to aquatic habitat and areas near aquatic habitat.</td>
</tr>
<tr>
<td>California Red-legged Frog \textit{Rana draytonii}</td>
<td>Amphibia</td>
<td>Threatened</td>
<td>Occurs in Arroyo Grande Creek and Estuary, Oso Flaco Lake, and Little Oso Flaco Lake. May use other water features throughout the site area.</td>
</tr>
</tbody>
</table>
Nipomo Mesa Desalination Plant Project

<table>
<thead>
<tr>
<th>Animal Species</th>
<th>Species Class</th>
<th>Federal Status</th>
<th>Habitat Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Pond Turtle</td>
<td>Amphibia</td>
<td>Endangered</td>
<td>Documented in Oso Flaco Lake and Arroyo Grande Creek. Other freshwater habitat may be used.</td>
</tr>
<tr>
<td>Emys marmorata</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tidewater Goby</td>
<td>Actinopterygii</td>
<td>Threatened</td>
<td>Occurs in Arroyo Grande Creek, Carpenter Creek, Oceano (Meadow Creek) Lagoon, Oso Flaco Creek, and Pismo Creek. Critical habitat is present in the site area.</td>
</tr>
<tr>
<td>Eucycloglus newberryi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steelhead</td>
<td>Osteichthyes</td>
<td>Threatened</td>
<td>Occurs in Pismo Creek and Arroyo Grande Creek. This species is localized to these creek systems and their confluences with the Pacific Ocean.</td>
</tr>
<tr>
<td>Oncorhynchus mykiss</td>
<td></td>
<td></td>
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<tr>
<td>irideus</td>
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1.1.27. Regulatory Setting
The following describes the federal, state and local regulatory framework that addresses biological resources.

Federal laws and Regulations

The Federal Endangered Species Act: The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) are the agencies that oversee the Federal Endangered Species Act (ESA). These agencies oversee a list of native species whose existence are in threat and need legal protections. These species are known as “listed” species. The list is organized by a species’ status of survival as threatened or endangered. The ESA prohibits the “take” of any listed species. Take, as defined by the ESA, means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”

Federal Clean Water Act, Section 404: The Clean Water Act (CWA) is the primary Federal law that protects the quality of wetlands, lakes, rivers, and coastal areas. Section 404 of the CWA regulates the discharge of dredged or fill material into the waters of the United States, including wetlands. Any discharge into the nation’s waters is deemed as unlawful unless authorized by a permit.


Federal Clean Water Act, Section 401: Section 401 of the Clean Water Act requires a Federal license or a permit for any activity that has the possibility of releasing discharge or pollutants into waters of the United States.59

Migratory Bird Treaty Act: Under the Migratory Bird Treaty Act of 1918 (MBTA), it is unlawful to take, kill, or possess migratory birds. This includes taking any parts, nests, or eggs of such birds (USFWS).

Bald and Golden Eagle Protection Act: The Bald and Golden Eagle Protection Act prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions. It is a violation to, “...take, possess, sell, purchase, barter, offer to sell, transport, export, or import, at any time or in any manner, any bald eagle commonly known as the American eagle, or golden eagle, alive or dead, or any part, nest, or egg, thereof...” Agitating and disturbing productivity by interfering with mating, feeding, or shelter is also prohibited.59

National Environmental Policy Act: The National Environmental Policy Act (NEPA) requires that Federal agencies include environmental impacts and alternatives in their decision-making processes. NEPA applies to actions on federal lands, federal funding, or federal agency acting as the lead agency. Environmental review is otherwise discussed through the California Environmental Quality Act (CEQA) (County of San Luis Obispo, 2020).

Ecological Services Program: The Ecological Services Program of the U.S. Fish and Wildlife Service helps administer the Endangered Species Act and works with scientist to identify species close to extinction and find a way to reduce impacts. The program works with partners in federal and state agencies, tribes, local governments, and private citizens, to help protect threatened or endangered species and protect their habitat (USFWS).

Federal Coastal Zone Management Act: The Federal Coastal Zone Management Act (CZMA) was passed in 1972. This act, administered by NOAA, provides management of coastal resources, including the Great Lakes. The goal is to “preserve, protect, develop, and where possible, to restore or enhance the resources of the nation’s coastal zone” (NOAA).

State Laws and Regulations

California Endangered Species Act (CESA): Administered by the California Department of Fish and Wildlife (CDFW), CESA prohibits the take of listed species and for formally under consideration for listing in California. CESA defines take as, “hunt, pursue, catch, capture, or kill

or attempt to hunt, pursue, catch, capture, or kill." CESA also prohibits the take of plants on private lands.60

**California Coastal Act:** The California Coastal Act of 1976 is a permanent protection of the state’s natural and scenic resources and promote public safety, health, and welfare, and protect public and private property, wildlife, marine fisheries, and other ocean resources. This act ensures existing developed uses, and future developments are carefully planned and are consistent with policies within this division (California Coastal Commission).

**California Fully Protected Species:** California Legislature identified species for protection under the California Fish and Game Code in 1960. Under this protection, the identified species may not be taken or possessed at any time, and no license or permits can be used for their taking. Exceptions to taking identified species is only allowed for scientific research and relocation of bird species for the protection of livestock.60

**Section 21083.4 of the Public Resource Code:** This section of the Public Resource code requires county government to determine if the project area will have significant impacts on the environment, specifically oak woodlands. If so, a proper mitigation and conservation methods must be devised with the aid of the county.

**Native Plant Protection Act (NPPA):** Established in 1977, this act is intended to protect certain species within California which are native to desert regions. Under the NPPA, it is unlawful to harvest the protected plants in private and public ally held lands. There are 64 species of plant listed under the NPPA. Some exceptions can be made for change of land use after proper notification to the CDFW (CDFW).

**California Environmental Quality Act:** CEQA is a law the requires public agencies to analyze and publicly disclose the environmental impacts of approved projects. Feasible alternatives and mitigation measures must be adopted if significant impacts to the environment are discovered. A mitigation below significant impact must be made and publicly disclosed with regards to the 220 plant species protected under CESA and NPPA (CDFW).

**California Fish and Game Code 3503 (Bird Nests):** Section 3503 of the California Fish and Game Code makes it “unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, expect as otherwise provided by this code or any regulation made pursuant thereto.” The California Department of Fish and Wildlife may issue permits authorizing take (County of San Luis Obispo, 2020).

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California Fish and Game Code 3503.5 (Birds of Prey): Section 3503.5 of the California Fish and Game Code prohibits the take, possession, or destruction of any birds of prey or their nests or eggs “except as otherwise provided by this code or any regulation adopted pursuant thereto.” The California Department of Fish and Wildlife may issue permits authorizing take of birds of prey or their nests or eggs pursuant to CESA or the NCCP Act (County of San Luis Obispo, 2020).

Regional Regulation

Coastal Zone Land Use Ordinance: The purpose of this ordinance is to guide and manage the future growth of the county in add or dance with the San Luis Obispo County General Plan. This entails the regulation of land use in a manner that will encourage development in an orderly means by enhancing and protecting the natural historical, cultural, archeological, and scenic resources (County of San Luis Obispo, 2019).

San Luis Obispo County General Plan: The San Luis Obispo County General Plan (General Plan) discusses development goals of the county and government decision making, as well as community involvement and informing the public about developmental guidelines. The plan includes ordinances and elements. Key elements within this plan relate to protecting biological resources in Land Use Element, as well as the Conservation and Open Space Element (County of San Luis Obispo, 2020).

San Luis Obispo County Local Coastal Program: The San Luis Obispo County Local Costal Program (LCP) is partnered with the California Coastal Commission. It is a tool for development in coastal zones. The LCP contains ground rules for future development and the protection of coastal resources (County of San Luis Obispo, 2020).

South County Area Plan: The South County Planning Area encompasses 98,910 acres including Santa Maria River to the south, the Pismo Dunes to the west, the coastal range on the east, and the Five Cities urban boundaries to the north. This plan allocates land use throughout the area by land use categories. This planning area will assist in creating projects that are consistent with adopted policies and regulations by providing standards used to address special problems and conditions within the individual communities (County of San Luis Obispo, 2020).

State Parks Habitat Conservation Plan: HCP is a conservation program that supports receipt of an incidental take permit under the Federal Endangered Species Act for endangered species that occur in the Pismo State Beach or the Oceano Dunes State Vehicular Recreation Area. The HCP will ensure that State Parks has sufficient conservation and avoidance measures in place to sustain these sensitive species while continuing to operate the parks for public recreation and enjoyment (California Department of Parks and Recreation, 2020).
Figure 13: Project site in relation to habitat of the Western Snowy Plover, Steelhead Trout, and California Red-Legged Frog
1.1.28. Potential Environmental Constraints and Recommendations

Below is a summary of the potential environmental constraints related to biological resources. This list was compiled from Appendix G of the CEQA Deskbook. Recommendations are also provided to minimize the potential impacts. A discussion of relevant thresholds and impacts is provided below the table.

Table 9: Potential biological environmental resource constraints and recommendations

<table>
<thead>
<tr>
<th>Thresholds of Significance</th>
<th>Potential Constraint</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?</td>
<td>The U.S Fish and Wildlife Service lists animal species and plant species within the project site and/or have potential to occur within project site. There are special-status species that occur in the site location and have potential to be impacted by new activities. Impacts can be avoided making this potentially less than significant with mitigation incorporated.</td>
<td>A permitted biologist in special-status species would be needed to create a habitat monitor system to mitigate potential impacts.</td>
</tr>
<tr>
<td>Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?</td>
<td>There are numerous California Department Fish and Wildlife (CDFW) sensitive natural communities within the site area, including central dune scrub, central foredunes, and northern coastal salt marsh. However, it is unlikely that changes will cause adverse effects making this impact potentially less than significant with mitigation incorporated.</td>
<td>We recommend that mitigation projects to protect riparian habitats or other sensitive natural communities be implemented during the planning process to help analyze potential impacts to the sensitive natural communities within project location.</td>
</tr>
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</table>
### Nipomo Mesa Desalination Plant Project

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<th>Potential Constraint</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?</td>
<td>Wetland habitats are identified within our project location. Development has the potential to cause impacts to federally protected wetlands. Impacts can be avoided making this potentially less than significant with mitigation incorporated.</td>
<td>Monitor potential hazardous materials involved during construction to prevent contamination to wetlands.</td>
</tr>
<tr>
<td>Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?</td>
<td>Existing covered activities occur in suitable aquatic habitat areas and could impact suitable habitat, eggs, tadpoles, or adults/juveniles. Impacts in upland habitat are expected to be rare, although dispersing individuals could be injured or killed. The project site exists within the migration route of the Pacific fly route, providing migrating birds with a stopover site. New projects could disturb wildlife activities. There is a possibility that there would be potentially more than significant impacts without mitigation.</td>
<td>To reduce these impacts, monitor programs should be implemented and should be aware of location of nests, brood, and adults in order to minimize situations where an adult might abandon eggs or chicks.</td>
</tr>
<tr>
<td>Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?</td>
<td>The proposed project activity plan would likely not conflict with the policies or ordinances which protect the biological resources. Possible conflicts can be mitigated to avoid significant impact. This project would likely yield potentially less than significant impacts with mitigation incorporated.</td>
<td>Under Public Resources Code Section 5090.35, the project will require that an inventory be taken of the wildlife populations in preparation of WHPP. The Wildlife Habitat Protection Plan will work towards conservation goals of improving existing wildlife habitats.</td>
</tr>
</tbody>
</table>
Nipomo Mesa Desalination Plant Project

<table>
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<tr>
<th>Thresholds of Significance</th>
<th>Potential Constraint</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?</td>
<td>The cumulative effects on species and habitats of the new HCP would be less than significant if the AMMs or mitigation measures mitigate the potential impacts and there is not a significant loss of habitat or special-status species. However, impacts can be avoided making this potentially less than significant impacts with mitigation incorporated.</td>
<td>Potential future projects considered in the cumulative analysis are an overview of the risk of impacts of these activities on special-status species, where risk is defined as the likelihood and magnitude of effect. As a result, risk is weighing both the frequency and severity of the impact. Therefore, even though an impact may be expected to occur, it may not result in a high or moderate risk if the impact is considered infrequent or is not severe.</td>
</tr>
</tbody>
</table>

No definitive statements can be made regarding our recommendations per the fact that the basis of our information is derived from previous research and reports from similar projects.

**Question 1:**

Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Future development has the potential to impact special-status plant and wildlife species within the project area. Development can cause land use changes and disturbances to critical habitats. Changes or disturbances can impact a variety of special-status species that are protected under federal, state, and regional laws and policies. Populations listed as either threatened or endangered within the project site can be protected by the ESA. Species with a special listing status can be protected by the California Endangered Species Act (CESA). Species and habitat protection measures will provide mitigation for species of concern.

To reduce impacts, there should be regular surveys for the listed special species as part of a habitat monitoring system. Staff that would be conducting plant propagation activities should be familiar with special-status plants in the project site area. This would limit the amount of time they would spend in known occupied habitat to reduce risk of trampling a special-status plant.
species. Wildlife biologist can focus on preservation or enhancement of habitat for special status species.

**Question 2:**

| Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service? |

Production of the Nipomo Mesa Plant Project has the potential to impact sensitive natural communities such as native dune scrub or maritime chaparral habitats. Special status species rely on the sensitive communities within the project location. Development activities have the potential to remove special status habitat, cause erosion, and/or introduce non-native and invasive species to project location. The San Luis Obispo County Local Coastal Program, who is partnered with the California Coastal Commission, is responsible for protecting these areas. Further protection to riparian habitats is covered in the Federal Clean Water Act, Section 404.

In addition to the existing policies and regulations, mitigation measures can be implemented to protect riparian habitats and other sensitive natural communities. Biological investigations can be conducted to see where exactly the sensitive communities and the project site overlap to limit potential impacts.

**Question 3:**

| Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? |

Section 404 of the Clean Water Act (CWA) regulates discharge of dredged or fill material into waters of the United States, including wetlands (U.S. EPA, 2015). The U.S. Army Corps of Engineers (Corps), under the Clean Water Act, has jurisdiction over “waters of the United States” and authorizes issue permits for discharge of dredged or fill material into such waters (County of San Luis Obispo, 2020). The U.S. Army Corps of Engineers would not approve permits that have the potential to affect federally protected wetlands. Construction of the Nipomo Mesa Plant Project has the potential to affect protected wetlands and cause hydrological interruption.

Mitigation measures to limit the potential risks to wetlands, marshes, vernal pools, and coastal regions include creating access routes and construction areas to avoid concerned areas. By creating an access route, construction vehicles can avoid nearby wetlands and limit possible hydrological interruptions. Cement, paint, oil, or any other hazardous substances involved during construction should be monitored to prevent contamination in protected wetlands.

**Question 4:**
Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The proposed project area exists along the path of a Pacific flyway for migratory birds. This creates a concern as the project area can act as a migratory stopping point. The Migratory Bird Treaty Act states that so long as the actions associated with the proposed project does not “take, kill or possess” any parts of the bird, including its eggs and nest, then the actions are acceptable (USFWS). Additionally, this project has the potential to impact movement of aquatic species during the construction of the pipelines, connecting the desalination plant to the Pacific Ocean. The construction does occur within the boundaries that are protected under ESHA, specifically the pipelines. There is the potential for aquatic species to be injured and even killed.

In order to curtail the chances of harming the wildlife species habitat or migratory movements, it is important to have a continuous monitoring program which will document that location and number of nests, broods, and adults. This program could minimize the chances that adults will abandon eggs and offspring. Additionally, the construction of the pipeline should not take place during periods of migration.

**Question 5:**
Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Under Public Resources Code Section 5090.35, the Nipomo Mesa Plant Project will require an inventory of the wildlife populations in preparation of the WHPP. The Wildlife Habitat Protection Plan will work towards conservatism goals of improving existing wildlife habitats. The proposed project activity plan would likely not conflict with the policies or ordinances which protect the biological resources. Possible conflicts can be mitigated to avoid significant impact. Additionally, the Coastal Zone Land Use Ordinance delineates how the land is developed in accordance with the SLO General Plan, which prioritizes environmental resources.

The proposed project activity plan would likely not conflict with the policies or ordinances which protect the biological resources. Possible conflicts can be mitigated to avoid significant impact. If the project were to conflict with policies, the South County Area Plan states that the county can intervene and aid in devising a plan that will put the project back on track.

**Question 6:**
Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The proposed project could result in significant cumulative impact and therefore conflict with the Oceano Dunes HCP if the construction results in repeated impact of species and habitats in
foreseeable future projects. The cumulative effects would be less than significant if the AMMs or mitigation measures mitigate the potential impacts and there is not a significant loss of habitat or special-status species. Potential future projects considered in the cumulative analysis are an overview of the risk of impacts of these activities on special-status species, where risk is defined as the likelihood and magnitude of effect. As a result, risk is weighing both the frequency and severity of the impact. Therefore, even though an impact may be expected to occur, it may not result in a high or moderate risk if the impact is considered infrequent or is not severe.

In order to ensure the protection of species and their respective habitats described within the HCP, having a designated biological resources overseer of the project would ensure that the conservation plans are not being compromised. Per the South County Area Plan (County of San Luis Obispo), the project can be stopped at any moment if the project deviates from the proposed vision which had been previously approved by the county. From there, the county will participate in the project by creating a plan that more fits the General Plan of San Luis Obispo County which will fit dependent on the theoretical issue the occurs.
4. Environmental Processes and Permits

This section describes the regulatory steps necessary to facilitate project approval. Relevant permits from state, county, and local jurisdictions are detailed with respect to development in the county as well as development within the coastal zone, as defined by the Coastal Act of 1976. Additionally, this section provides an overview of what can be expected during the California Environmental Quality Act (CEQA) process. The CEQA process can be lengthy and complex, and this section aims to provide context with respect to the eventual approval of this development in addition to a summary of CEQA phases and a general CEQA timeline.

4.1. Land Use and Coastal Commission Permitting

The permitting process associated with the approval of development projects within the state of California and County of San Luis Obispo is extensive. Because the proposed project site for the Nipomo Mesa Desalination Plant Project is located within the coastal zone as defined by the Coastal Act of 1976, more agencies and permits are involved in addition to those necessary for development within the county. These permitting processes are designed with the intention of guiding development in a way that balances the interests of all stakeholders. Environmental, socioeconomic, and community development goals are all considered during the permitting and California Environmental Quality Act processes. There are permits and approvals associated with the California Coastal Commission at the state level, the County of San Luis Obispo and Local Coastal Plan and the county level, and specific South County Coastal Area requirements at the local level.

1.1.29. California Coastal Commission

Overview

California Coastal Commission (CCC) is a state agency which was established in 1972 via voter initiative (Proposition 20), later made permanent through Legislature in the California Coastal Act of 1976. In partnership with coastal cities and counties, the Coastal Commission plans and regulates the use of land and water in the coastal zone at the state level. Development activities, which are broadly defined by the Coastal Act to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal permit from either the Coastal Commission or the local government. If an area has a certified Local Coastal Plan (LCP), such as San Luis Obispo County, Coastal Development Permits are applied to and awarded by the LCP, with oversight from the California Coastal Commission. The county can issue development permits for projects within the coastal zone, but the California Coastal Commission has ultimate authority in the interpretation of Title 23 for the approval of permits. Specific permits will be detailed in the San Luis Obispo County Local Coastal Plan section.

1.1.30. San Luis Obispo County Local Coastal Plan

Overview
While San Luis Obispo County is required to comply with all requirements outlined by the Coastal Commission, there are additional land use permits required by the county. Consistent with the CCC, the County defines a “development” within the Coastal Zone as any construction or development that takes place on land or under water. The main purpose for issuance of specified permits is to manage current and future growth within the county outlined in the general plan, to regulate the manner upon which the land is used, minimize any detrimental effects of land use on the public, enhance and preserve any natural, historic, archeological, and scenic resources identified by the county, and finally making all regulations understandable and indefinable by all citizens. As a certified LCP, the County can issue development permits, though the CCC is the ultimate authority over coastal development permitting. As the agency issuing development permits, the permits required by the CCC through the LCP are detailed here.

**Requirements**

General requirements for land use permits depend on activities planned for each phase of the project, and potential effects directly on site and surrounding the site. Determining which permit will depend on the allowable use of the project which is compared to the current use of the land. Allowable uses include dwellings, manufacturing & processing, wholesale trade, outdoor storage, retail trade, services & other residential uses, site disturbance, and impervious surface coverage. If the project should require more than one of the listed uses, then a permit with further restrictions will apply. The required permits are pursuant to Title 23, with guidance from the CCC and the Coastal Act. As a part of the jurisdiction of the County of San Luis Obispo LCP, the County can issue respective permits with oversight from the CCC.

**Plot Plan 23.02.030**

A Plot Plan is a ministerial land use permit. The purpose of the Plot Plan is to certify that the development of the proposed site satisfies provisions of the Coastal Zone Land Use Ordinance. Plot Plans are part of the construction permit application and functions as a “Zoning Clearance.” Approval of a Plot Plan would mean that the land use would perform standard requirements related to a construction permit.

Application of a Plot Plan would require forms by the Planning Department, as well as appropriate scale drawings of the proposed development and site layout plan. The site layout plan must include site location and dimensions, road access and street improvements, building and structures, easements, utilities, site improvements, and landforms.

**Minor Use Permit 23.02.033**

The purpose of the Minor Use Permit is to comply with notice and public hearing requirements by the California Coastal Act for Plot Plans and other land use permits. It is
a discretionary permit and includes public review for proposals that don’t meet the requirements for a Planning Commission review. It deals with proper investigation of land uses and, depending on type or size, investigates the placement of the proposed development. The Minor Use Permit provides a public hearing before the Planning Director.

If the Minor Use Permit were to get approval, the application would include preliminary floor plan, architectural elevations, adjacent land use information, a landscape plan, and a contour map. The contour map would involve inside urban reserve lines, outside urban reserve lines, and areas in excess of 30% slope. For processing, the Minor Use Permit will go through the Planning Department and shall be subject to an environmental determination, required by California Environmental Quality Act (CEQA).

**Development Plan 23.02.034**

The Development Plan is similar to the Minor Use Permit. The Development Plan enables public review of significant land use proposals and involves integration into the community of land uses, depending on intensity and project layout. This plan includes a public hearing before the Review Authority. The Development Plan is discretionary, and if it is approved, then the application would include a Development Plan content, and Development Plan processing. Under the Development Plan processing, there is an environmental determination which is required by the California Environmental Quality Act (CEQA). After completion of the environmental determination, a staff report shall be prepared and describe characteristics of the proposed land use or development project. A Public hearing will be held by the Planning Director and Review Authority.

**Coastal Development Permit 23.01.031**

The California Coastal Commission, or the respective Local Coastal Plan, generally requires a Coastal Development Permit for any development within the coastal zone. This permitting process allows for the public to review the significant land use proposal. Though there is no change in land use expected, the construction of new facilities constitutes development according to the Coastal Commission, and therefore likely requires Coastal Development permitting. This permitting process intends to guide proper development of the coastal zone in conjunction with local plans, and general community development.

A Coastal Development Permit application must be prepared only by either the recorded owner of the property, an authorized agent of the owner, or the developer of the proposed development. The application will contain a number or relevant documents and pieces of information, including a scaled site plan, elevations of existing structures, engineering and geology reports, a report detailing potential impact mitigations with professional guidance from a hired civil engineer and geologist, an agency waiver, and any other
information required by the director of planning and city engineer. Upon approval from the issuing body, applications for a Coastal Development Permit are considered by the planning commission through a public hearing. Decisions are reached within 7 days of the hearing. Upon approval from the planning commission, the city council has 15 days to either confirm the action, amend the action, or conduct another public hearing. If the applicant is unhappy with the decision made by the planning commission, they can appeal directly to the city council. Furthermore, any decision can be appealed to the California Coastal Commission.

**Permit 23.08.284 - Pipelines**

If the project requires the installation of pipelines, permit 23.08.284 will be required. Because the scope and construction of pipelines is undefined so far and is not included in this Environmental Constraints Report, it is recommended that further research is conducted with respect to the applicability of Permit 23.08.284 when more specific information is available.

1.1.31. South County Coastal Area Plan

**Overview**

The South County Planning Area provides an outline of the specific land use policies for the coastal zones encompassed within the 98,910 acres in the southwestern portion of San Luis Obispo County, within which the proposed project site is located. Within this area is a wide array of land uses: urban, suburban, rural, industrial, agricultural, and scenic. This plan allocates land use throughout the planning area by land use categories, and initiates use of the Resource Management System. The South County Coastal Area Plan will be referred to in the construction of the Nipomo Mesa Desalination Plant as the project falls within the jurisdiction of “South County.”

**Requirements**

The following standards and permits must be met according to the South County Coastal Area Plan, in addition to permits required by the LCP and CCC.

**Landscape Buffer**

For projects located along Highway 1, there are certain landscaping standards that must be met. Trees must be retained whenever possible along Highway 1, and the project must provide a 50-foot landscaped buffer at minimum whenever feasible.

**Setbacks**

For projects located along Highway 1 with industrial land use, such as the Nipomo Mesa Desalination Plant Project, projects must be set back at least 50 feet from Highway 1.

**Site Location.**
The site location will minimize the impacts of rare and endangered flora species and will be located to provide a buffer from exposed dune areas within the site. A qualified biologist will survey the site to ensure proper action is taken as well as suggest necessary mitigation and/or alternatives. (LCP)

4.2. CEQA Process Steps and Estimated Timeframe

The California Environmental Quality Act (CEQA) establishes state administration and oversight of environmental impact review as well as the procedures to ensure compliance. The purpose of CEQA is threefold; to inform decisionmakers and the public about potential impacts and mitigation measures, demonstrate that an effort is being made to preserve the environment, and ensure political accountability. The County of San Luis Obispo will likely be the Lead Agency, having primary responsibility for carrying out or approving the project as well as the responsibility for preparing the CEQA document. The client would be a responsible agency, with an active role in the CEQA process and the responsibility to require changes to its project that would avoid or substantially reduce all significant impacts.

Figure 14: Major CEQA phases and estimated timeframes

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Review</td>
<td>Initial Study</td>
<td>ND/MND or EIR</td>
<td>Decision Documentation</td>
</tr>
<tr>
<td>1-3 months</td>
<td>4-19 months</td>
<td>10-18 months</td>
<td>1 month</td>
</tr>
</tbody>
</table>

Total Time approx. 2 – 3 years

---

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Phase 1 – The first phase involves a voluntary pre-application consultation with the Lead Agency. This consultation will provide the applicant an opportunity to learn about possible impacts, alternatives, and mitigation measures. An application is then submitted to the Lead Agency who is responsible for review and determination of completeness. The Lead Agency also determines if any exemptions apply to the project such as a one with no possible impacts or that is covered by a previous EIR. Any action that is determined to fall outside of the definition of project or is applicable for an exemption does not need to comply with the remainder of CEQA.

Phase 2 – The second phase involves an initial study which is conducted by the lead agency. This study consists of consultation with the responsible and trustee agencies regarding potential impacts based on the project description. The Lead Agency uses this initial study to determine whether the project requires an Environmental Impact Report (EIR) or whether they can issue a negative declaration (ND) which states that there is no possibility of any significant environmental impact due to the project and no more evaluation is needed.

Phase 3 – The third phase starts when a notice of preparation is filed to the responsible and trustee agencies. Responses are returned to the lead agency within 150 days. A contract is then executed by the Lead Agency within 140 days of receipt from the responsible and trustee agencies. Responsible agencies are other parties with discretionary approval over the project. The trustee agencies for this project will be the CDFW, SLC, and CDPR. A preliminary draft EIR is prepared and submitted for review. An optional public review of the draft EIR is held within 30–45 days of submission. Responses to comments are prepared and sent to the agencies within 10 days before the decision to accept or edit a draft EIR. The final EIR is certified within 1 year of acceptance and a decision is made by the Lead Agency on the project within 5 months of certification. The responsible agency is then able to make a final decision on the project within 180 days of decision by the Lead Agency.

Phase 4 – The final phase of a CEQA EIR is certification and documentation of findings. The lead agency may issue a mitigated negative declaration (MND) if the project’s impacts can be reduced below the thresholds of significance with mitigation. Approval of a project due to either a ND or MND must be posted within 5 days of approval of the project. It must remain posted for 30 days prior to final approval.

Figure 15: Simplified CEQA agency involvement
4.3. Regulatory Permit Analysis

1.1.32. Introduction
In addition to compliance with all development standards, area plans, and permits at the local level, there are many federal and state permits that may be required for the Nipomo Mesa Desalination Plant Project. The permitting process will require interaction with a number of agencies at the federal, state and regional levels. Relevant legislation is wide ranging, spanning from sweeping national acts such as the Clean Water Act to smaller regional ordinances such as construction development permits. While this list may not be entirely comprehensive, it represents an initial analysis of the possible permitting requirements for a project of this scale and content.

This section will detail the various permits that may be required, as well as the corresponding agencies that will require consultation. Additionally, this section defines the specific activity within the project that will require permitting and regulation. While the permitting process can be complex and lengthy, this section provides context as to the extent of the relevant regulatory requirements for a project such as this. The matrix below summarizes the potential permits and agencies involved, and the discussion that follows provides specific guidance with respect to the application and permit acquisition process.
### Table 10: Major relevant regulations and permits relating to water and biological resources

<table>
<thead>
<tr>
<th>Regulatory Agency</th>
<th>Underlying Statute or Regulation</th>
<th>Permit/Approval</th>
<th>Regulated Activity</th>
<th>Other Related Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Federal Agencies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers</td>
<td>Rivers and Harbors Act 33 U.S.C. §400 – 467 (1899)</td>
<td>Section 10 Permit</td>
<td>Construction, excavation, or deposition of materials in, over, or under such waters, or any work which would affect the course of those waters.</td>
<td>NEPA compliance</td>
</tr>
<tr>
<td>US Army Corps of Engineers</td>
<td>Clean Water Act 33 U.S.C. §1251 et seq. (1972)</td>
<td>Section 404 Individual Permit or Nationwide Permit</td>
<td>Any point source discharge of dredged or fill material into Waters of the US. Including bank stabilization and grading in the Waters of the US. Both temporary and permanent impacts.</td>
<td>• NEPA compliance&lt;br&gt;• Compliance with the NHPA Consultation under Section 106 through the SHPO.&lt;br&gt;• California Coastal Commission Letter of Concurrence with the CA Coastal Act.&lt;br&gt;• RWQCB Section 401 Water Quality Certification; requires CEQA compliance (see below)</td>
</tr>
</tbody>
</table>
### Nipomo Mesa Desalination Plant Project

<table>
<thead>
<tr>
<th>Regulatory Agency</th>
<th>Underlying Statute or Regulation</th>
<th>Permit/Approval</th>
<th>Regulated Activity</th>
<th>Other Related Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Fish and Wildlife Service</td>
<td>Endangered Species Act 16 U.S.C. §1531 et seq. (1973)</td>
<td>Section 7 Consultation - and/or - Section 10 Incidental Permit - and/or – Safe Harbor Agreement</td>
<td>Potential impacts to federally-listed species, species proposed for listing, and/or designated Critical Habitat of such species.</td>
<td>Biological Opinion (Section 7) Habitat Conservation Plan (Section 10)</td>
</tr>
<tr>
<td>NOAA Fisheries</td>
<td>Endangered Species Act 16 U.S.C. §1531 et seq. (1973)</td>
<td>Section 7 Consultation - and/or - Section 10 Incidental Permit - and/or – Safe Harbor Agreement</td>
<td>Potential impacts to federally-listed marine and anadromous species, species proposed for listing, and/or designated Critical Habitat of such species.</td>
<td>Biological Opinion (Section 7) Habitat Conservation Plan (Section 10)</td>
</tr>
</tbody>
</table>

**State and Regional Agencies**

| Central Coast Regional Water Quality Control Board | Clean Water Act 33 U.S.C. §1251 et seq. (1972) | Section 401 Water Quality Certification | Required for actions that trigger a Clean Water Act Section 404 permit (see above) to certify that a discharge will not violate state water quality standards. Applies to Waters of the US. | CEQA compliance                                                                      |
Nipomo Mesa Desalination Plant Project

<table>
<thead>
<tr>
<th>Regulatory Agency</th>
<th>Underlying Statute or Regulation</th>
<th>Permit/Approval</th>
<th>Regulated Activity</th>
<th>Other Related Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Coast Regional Water Quality Control Board</td>
<td>Clean Water Act 33 U.S.C. §1251 et seq. (1972)</td>
<td>National Pollution Discharge Elimination System Permit</td>
<td>Point sources that discharge pollutants into Waters of the US. Point sources are discrete conveyances such as pipes or man-made ditches. Examples of pollutants include, but are not limited to, rock, sand, dirt, and agricultural, industrial, and municipal waste.</td>
<td>NEPA and CEQA compliance</td>
</tr>
<tr>
<td>Central Coast Regional Water Quality Control Board</td>
<td>Porter-Cologne Water Quality Control Act (CA Water Code Section 7)</td>
<td>Waste Discharge Requirement</td>
<td>Activities, discharges, or proposed activities or discharges that could affect California’s surface, coastal, or ground waters.</td>
<td>CEQA compliance</td>
</tr>
</tbody>
</table>
Nipomo Mesa Desalination Plant Project

<table>
<thead>
<tr>
<th>Regulatory Agency</th>
<th>Underlying Statute or Regulation</th>
<th>Permit/Approval</th>
<th>Regulated Activity</th>
<th>Other Related Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Coast Regional Water Quality Control Board</td>
<td>Construction General Permit Order 2009-0009-DWQ</td>
<td>Construction General Permit</td>
<td>Dischargers whose projects disturb one (1) or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres.</td>
<td>Development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer (QSD).</td>
</tr>
<tr>
<td>California State Lands Commission</td>
<td>CA Code of Regulations Chapter 1 (State Lands Commission), Division 3 (State Property Operations), Title 2 (Administration)</td>
<td>Lease agreement</td>
<td>Portions of the project located within Public Trust lands (the beds of tidal and navigable waters acquired at statehood in 1850)</td>
<td>CEQA compliance</td>
</tr>
<tr>
<td>California Coastal Commission</td>
<td>California Coastal Act (PRC Division 20)</td>
<td>Coastal Development Permit Appeal Authority Letter of concurrence with CWA Section 404 permit.</td>
<td>Activities that affect land or water uses or natural resources of the coastal zone must be reviewed for consistency with the California Coastal Management Plan (CCMP).</td>
<td>CEQA compliance</td>
</tr>
</tbody>
</table>
### Nipomo Mesa Desalination Plant Project

<table>
<thead>
<tr>
<th>Regulatory Agency</th>
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<th>Permit/Approval</th>
<th>Regulated Activity</th>
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</tr>
</thead>
<tbody>
<tr>
<td>California Department of Fish and Wildlife</td>
<td>Section 1602 of the California Fish and Game Code</td>
<td>Lake and Streambed Alteration Agreement</td>
<td>Initiation of any construction project that will: 1) substantially divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; 2) use materials from a streambed; or 3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake.</td>
<td>CEQA compliance</td>
</tr>
<tr>
<td>California Department of Fish and Wildlife</td>
<td>California Endangered Species Act (California Fish and Game Code Division 3, Chapter 1.5)</td>
<td>Section 2081(b) (Incidental Take Permit)</td>
<td>Required if a project has the potential to affect state-listed listed or protected species or their habitats, either directly or indirectly.</td>
<td>n/a</td>
</tr>
<tr>
<td>Regulatory Agency</td>
<td>Underlying Statute or Regulation</td>
<td>Permit/Approval</td>
<td>Regulated Activity</td>
<td>Other Related Approvals</td>
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<td>-----------------------------------</td>
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<td>-----------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------</td>
</tr>
<tr>
<td>State Historic Preservation Office</td>
<td>National Historic Preservation Act of 1966 (16USC470)</td>
<td>Section 106 Compliance</td>
<td>Required for actions that trigger a Clean Water Act Section 404 permit (see above) to ensure federal agencies consider the impact of their actions on historic properties and provide the Advisory Council on Historic Preservation with an opportunity to comment on projects before implementation.</td>
<td>Consult Tribal Historic Preservation offices (THPO)</td>
</tr>
</tbody>
</table>
Projects that have the possibility of altering streams or wetlands are subjected to permits. This includes activities that would improve streams and wetlands. The U.S. Army Corps of Engineers (USACOE) has jurisdiction under the Rivers and Harbors Act (RHA) Section 10 that permits construction, excavation, or deposition of materials in, over, or under waters or any work that would affect the course, location, condition, or capacity of waters. For restoration of Little Oso Flaco Creek, a construction permit is required by the USACOE.

The USACOE must also issue a Section 404 permit under the Clean Water Act (CWA) before any point source discharge of dredge or fill material into the Waters of the United States. Under Section 404, a permit is required for any permanent fill in waters which include dams, culverts, bank stabilization. A permit is also required for any temporary fill in waters such as access ramps and surface water diversions. We do not have a detailed project description for our development project, however, if any infrastructure requires development within the Waters of the United States such as a permanent or temporary fill, then a permit is needed under Section 404 of the CWA.

There are three different types of CWA Section 404 permits: Regional General Permit, Nationwide General Permit, and Individual Permit. An Individual Permit would need to be issued for construction of intake and discharge pipelines, as well as restoration of the Little Oso Flaco Creek. An Individual Permit is required for projects that have more extensive impacts to areas under USACOE jurisdiction. The Individual Permit includes conditions such as protection to threatened or endangered species, protection of historic properties, and application of suitable material.

The Clean Water Act (CWA) Section 404 permits require a few prerequisites for approval. The first is a consultation with the State Historic Preservation office regarding potential cultural resources in compliance with the NHPA under Section 106. Secondly, Section 404 requires a California Coastal Commission Letter of Concurrence needed for projects located in the Coastal Zone. Third is a receipt of a Regional Water Quality Control Board (RWQCB) 401 Water Quality Certification. And lastly, is consultation under the federal Endangered Species Act.

The RWQCB issues Section 401 of the Clean Water Act stating that the state of California must certify that a discharge will not violate state water quality standards prior to the issuance of a 404 permit. The RWQCB also is regulated under the Porter-Cologne Water Quality Control Act (1969) which issues Waste Discharge Requirements program (WDR), National Pollution Discharge Elimination System (NPDES), and the Storm Water Pollution Prevention Plan. The RWQCB regulates the entire project relating to water quality in both direct and indirect impacts.

The ESA of 1973 requires that Federal agencies work to conserve threatened and endangered species. Through the section 7 of ESA, also known as “Interagency Cooperation,” Federal agencies must confer with the U.S. Fish and Wildlife Service when any action is carried out that may affect any listed threatened or endangered species. The process generally consists of an informal consultation, followed by
discussions between the two agencies who will determine the listed species, the proposed actions, and the effects of the proposed actions. Depending on whether the federal agency deems the proposed actions as likely to affects species or critical habitats, a biological assessment may or may not be required.

A Section 10 consultations are meant to regulate a wide range of actions which have the potential to affect plants and animals identified as threatened or endangered under ESA. There are some exceptions to activities that could result in the taking of listed species and their critical habitats which receive authorization via permit from FWS or National Marine Fisheries Service (NMFS). Activities permitted under a section 10 consultation of ESA will be specifically for scientific purposes or the propagation or enhancement of listed species.

Section 10(I)(b) is an Incidental Take Permit and is initiated when the planning activities could result in the incidental taking of a listed species. The application for Section 10 must include a habitat conservation plan (HCP). The HCP would define proposed actions in the planning activities and determine the effects of those actions on affected fish and wildlife species and their habitats which includes both proposed and candidate species. Section 10 authorizes services to minimize and mitigate adverse impacts to species to the maximum extent.

Both Section 7 and Section 10 consultation with the U.S. Fish and Wildlife Service are applicable for biological species. Section 7 consultations are required for the endangered species within the project boundaries, such as the La Graciosa and their respective habitats as well as the California Least Tern. The snowy plover falls outside of federal jurisdiction, therefore a Section 10 consultation with the U.S. Fish and Wildlife is necessary.
4.4. Summary of Findings

The purpose for the Nipomo Mesa Desalination project is to analyze the key environmental constraints and future impacts with constructing the desalination plant. Four environmental issue areas were discussed in detail in this report along with land use and regulatory permitting involved with this project. Figure (x) was created to visualize potential constraints for overall project. The map helps discover the best place for associated pipelines from ocean to plant and plant to community. Additionally, it helps identify where to introduce utilities such as access roads and power lines for proposed project. Project site parcels were designed from the San Luis Obispo County Land Use supplied map.

Figure 16 Final constraints for the Nipomo Mesa Desalination Project
Nipomo Mesa Desalination Plant Project
5. References


Nipomo Mesa Desalination Plant Project


Nipomo Mesa Desalination Plant Project


Nipomo Mesa Desalination Plant Project

Williams, Andrew. (1, January 2016). Desalination: Chemical Use in Water Treatment. 2021 May.  
Draft Environmental Constraints Report for the

Nipomo Mesa Desalination Plant Project

Prepared for:
The Central Coast Economic Recovery Initiative (ERI)
Arroyo Grande, CA

Contact:
Jimmy Paulding

Prepared by:
DUNES Environmental Group /Group 2
NR 425 Spring 2021
Cori Dech, Andrew Esperanza, Gissella Quiroga, Simran Singh, Robert Westbrook

Disclaimer: The following document has been prepared as part of the undergraduate curriculum for NR 425 (Applied Resources Analysis and Assessment) at California Polytechnic State University, San Luis Obispo. The intent of this academic exercise was to simulate the real-world process of preparing an environmental constraints and permitting analysis; however, it is important to note that the environmental and permitting constraints identified herein have not been technically peer reviewed by subject matter experts. This document is to be used for informational purposes only.

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Student Work Product - For Informational Purposes Only
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Introduction

The Economic Recovery Initiative (ERI) is interested in the feasibility of the Nipomo Mesa Desalination Plant Project (referred to as the Nipomo Mesa Project). The County of San Luis Obispo will most likely be the lead agency for the Environmental Impact Report (EIR) which would be conducted if the Nipomo Mesa Project moves forward. The ERI has prompted the analysis in order to study the feasibility of repurposing the existing Phillips 66 Santa Maria Oil Refinery in Arroyo Grande, California into a desalination plant and rehabilitating the land and ecosystems within the census-designated parcel boundaries. As a result, this environmental constraints report has been written to inform the ERI of the possibility of constructing the Nipomo Mesa Project.

Purpose and Scope of the Environmental Constraints Analysis

An environmental constraints analysis is prepared in order to provide a preliminary description of existing environmental conditions and, if applicable, explores potential strategies and/or recommendations to mitigate identified problems. An environmental constraints analysis includes analysis objectives, an in-depth discussion of the Nipomo Mesa Project description and project area description, an exploration of potential problems and impacts, and identifying any recognizable potential project constraints. Constraints are factors that can limit the Nipomo Mesa Project planning and implementation process, such as biological or cultural resource constraints, legal constraints, permit requirements, or potential project stakeholders. The purpose of analyzing constraints is to help the ERI to identify important environmental issues in order to inform project planning components such as environmental impact mitigation strategies, project plan alterations and/or alternatives, and permitting requirements needed for project implementation.

More specifically, this analysis identifies potential constraints for project implementation based on the presence or absence of existing resources, describes existing policies, permits, or stakeholders that apply to the Nipomo Mesa Project, and identifies potential environmental mitigation strategies and recommendations.

The California Environmental Quality Act (CEQA) Guidelines Section 15262 states that a project involving only planning studies for possible future actions which has not been approved of, adopted, or funded does not require the preparation of an Environmental Impact Report or a Negative Declaration but," does require consideration of environmental
Nipomo Mesa Project factor (CEQA).” Thus, no documentation under CEQA has been prepared for this analysis. This document is solely for planning purposes and to inform the ERI; the concepts presented in this analysis have not been developed, nor supported by professional agencies. This document is not a reliable source for environmental constraint evaluation, data regarding sensitive species, or the specifics of each phase of the Nipomo Mesa Project; professional surveys of the Nipomo Mesa Project site as well as specific project plans will be necessary for future actions. Most information synthesized in this report is a result of internet research, existing CEQA documents and reports, United States Fish and Wildlife data, ArcGIS mapping, and client info.

### Project Description

#### Project Location and Existing Site Characteristics
The Nipomo Mesa Project consists of two components, the desalination facility and the restoration area. Both components will be located on the 1,780-acre Phillips 66 property in Arroyo Grande, California (Figure 1). The desalination facility will be constructed on the 200-acre Santa Maria Facility (SMF) at 2555 Willow Road (Phillips 66, “Santa Maria Facility”). The restoration will take place on the rest of the 1,780-acre property around the facility. Other potential areas for restoration will be identified; if the desalination plant uses less land than the 200 acres of the SMF, the possibility of restoring the land is plausible.

The Phillips 66 property can be accessed via Highway 1. Since the property is near the coast, all the parcels it is composed of are under the Coastal Zone South County Coastal Planning area and are therefore subject to specific laws (County of San Luis Obispo, “Land Use View”). The property as a whole is zoned as industrial, for the SMF, and open space, for the preserved land (Figure 2) (County of San Luis Obispo, “Land Use View”). The oil refinery has combining designations of flood hazard and coastal zone (Perez et al., 2012). To the West, the property is surrounded by recreational land use; to the East, it is surrounded by industrial, agricultural, and recreational land use (Figure 2) (County of San Luis Obispo, “Land Use View”). Industrial, agricultural, and residential surround it on the North side and agricultural land to the South (Figure 2) (Perez et al., 2012).

At this time, the property is being used for an oil refinery, open space, and cattle grazing (Phillips 66, “Santa Maria Facility”). The refinery processes 44,500 barrels of crude oil per day (Phillips 66, “Santa Maria Facility”). It was built in 1995 and has switched ownership a few times before Phillips 66 came to own it; previous owners include: the Union Oil Company of California, Unocal, Tosco Corp., Phillips, and ConocoPhillips (California Energy Commission, 2020). In addition to the oil refinery, the property also contains 630 acres of preserved land on the west side; this preservation was designated under the 2000 Guadalupe-Nipomo Dunes Preserve Management Program (Shuman, 2021).
Figure 1. Geology and Soil Resources Impact A4
Figure 2. Map of the land use designations within the Phillips 66 property and around it.
Project Objectives
The Nipomo Mesa Project objectives are multifaceted, aiming to address issues in the San Luis Obispo County region spanning from socioeconomic resource issues to environmental issues. This report will identify the environmental constraints associated with all phases of Nipomo Mesa Project after remediation of the site, which is to be completed by the applicant. Specific objectives are as follows:

- Mitigate the impacts of the COVID-19 pandemic on the Central Coast region through economic recovery plan that focuses on clean energy investment, sustainable tourism, and creation of jobs.
- Increase resilience of local economy to withstand future economic shocks through strategies that seek to make the regional economy more economically and environmentally resilient and diverse.
- Utilize the untapped potential of talent and resources in local community through collaboration and inter-agency partnerships.
- Work to resolve the water supply issues of the region through desalination of ocean water.
- Reduce stress on groundwater basins in the region by providing an alternative water source.
- Remediate former refinery site and repurpose refinery facility.
- Preserve habitats and ecosystems located within the Nipomo Mesa Project site, as well as the nearby Environmentally Sensitive Habitat Area (ESHA), Oso Flaco Creek, freshwater lakes, and Pismo Dune area.

Project Phases
This section provides a general overview of the major phases that would be required to repurpose the existing project site and develop and operate a desalination facility. The three primary phases include refinery decommissioning and remediation, desalination plant construction and operation, and environmental restoration. An additional step for project funding, design, and approval would occur before the desalination plant could be built; however, this report will focus on the phases that will affect the physical, biological, and chemical properties of the site.
Before any new development can occur on the Nipomo Mesa Project site, the existing Phillips 66 Santa Maria Refinery facility must be decommissioned and remediated. Historically, oil refinery locations have been found to carry large deposits of coal and petroleum in their soils long after the refineries are closed. It is also important to note that groundwater is historically known to be contaminated by oil refineries. Currently, the US EPA has the Phillips 66 Santa Maria Refinery site location listed as one of the locations in their “Cleanups in My Community” and the groundwater migration action is currently listed as “Not Controlled” (US EPA, 1997). This location may potentially need remediation for groundwater resources as well and another preliminary study to analyze the current existing conditions of the groundwater should be performed.

Decommissioning plans need to be prepared and executed alongside environmental permitting authorizations. Planning, engineering, environmental studies and compliance, removing piping, removing platforms, and disposing of waste are major steps in decommissioning an oil refinery (NES Fircroft, n.d.). For the purposes of this analysis, it is assumed that the decommissioning and remediation process would be completed by the current owner of the property. Addressing the potential environmental impacts associated with the decommissioning and remediation phase is outside of the scope of this report.

Desalination Plant Construction and Operation

Construction and operation of the proposed desalination plant would occur entirely within the existing 183.6-acre refinery facility footprint located on Assessor Parcel Number (APN) 092-401-011 and APN 092-401-005[3]. The location of support infrastructure (e.g., pipelines, transmission lines, etc.) is unknown at this time and should be designed based on the results of the constraints analysis.

The phase of construction is likely the most costly and time consuming phase. Construction is broken up into repurposing the existing site for the desalination plant and upgrading infrastructure. Due to the differences between an oil refinery and a desalination plant, it is assumed that none of the existing facilities would be reused other than the roads. The pipelines, utilities, and electrical services that would accommodate the desalination plant do not match the facilities currently in use by the Phillips 66 Santa Maria Refinery. The current roads would be used for construction of the new desalination plant as well as be re-used for access to and from the plant when it is fully opened.

New infrastructure would consist of pipelines, buildings, filtration systems, pumping stations, and waste treatment. Additional details regarding the infrastructure required for a desalination facility is included in the “Desalination Plant Components” section below. In addition, due to the increased need for electrical power, it is assumed that the construction
phase would include the development of new transmission lines and other required infrastructure upgrades.

**Ecological Restoration**

Another key phase of the Nipomo Mesa Project involves the ecological restoration of the remainder of the Phillips 66 property located outside of the current facility footprint. This includes approximately 1,645 acres located on the following APNs: 091-141-062, 092-391-034, 092-391-020, 092-391-021, 091-192-034, 092-401-005, 092-401-011, 092-401-013, 092-411-005, and 092-411-002.

Restoration efforts will be directed towards improving the environmental and ecological condition of the degraded dune habitat and the degraded Little Oso Flaco Creek. Restoration efforts can take a variety of years based on the ecosystem being restored, the goal of restoration, and the funding and support for the restoration. For the Nipomo Mesa Project site, restoration would occur after the majority of the infrastructure was built and would continue for several years to account for ongoing monitoring and adaptive management measures.

**Desalination Plant Components**

The proposed desalination plant is recommended to be constructed on the 200 acres (of the 1,780-acre property) currently occupied by the Phillips 66 Santa Maria Refinery campus as to avoid occupying any undisturbed land or habitats. This section will provide an overview of the typical components of a seawater reverse osmosis (SWRO) desalination plant. Reverse osmosis is a widely employed water purification technology and is the leading process for desalination. Reverse osmosis uses applied pressure to induce water permeation through a semipermeable membrane while omitting salts. This process uses less energy than most thermal distillation technologies. This process also requires extensive pretreatment to prevent critical failure of the membrane during operation.

Desalination plants can vary significantly in size, based on desired output. For reference, the largest desalination plants in California are found in Carlsbad and Huntington Beach. Both facilities were designed to produce 50 million gallons per day (MGD) or 56,000 acre-feet per year (afy) of potable water. The Carlsbad beach desalination facility occupies a 4-acre parcel. The Huntington Beach plant spans 11 acres.

Due to the lack of project design details or guidelines, this report provides three options for possible desalination plant sizes, production amounts, and energy consumption values (Table 1) based off California water trends and residential energy consumption data (Peterson, 2017; Legislative Analyst’s Office, 2017). The actual size of the desalination plant will be decided by the stakeholders and based on local limiting factors such as available...
Nipomo Mesa Project

industrial zoning space, energy consumption, amount of water produced, and is that water enough to supply an appropriate amount of community members.

<table>
<thead>
<tr>
<th>Table 1. Typical Desalination Plant Size</th>
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<tbody>
<tr>
<td>Water Production Supply (Daily Average)</td>
</tr>
<tr>
<td>30 million gallons</td>
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<tr>
<td>50 million gallons</td>
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<tr>
<td>80 million gallons</td>
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</table>

The following paragraphs provide additional details regarding the typical components required for the construction and operation of a SWRO facility (Figure 3).

**Intake System**
The first step in a desalination treatment plant is the intake of ocean water and delivery to the plant. The intake location and type can vary - onshore intake, offshore intake, deep-water intake, and sub-seafloor intake are all potential options. The use of beach wells would substantially increase the risk of seawater intrusion into the regional groundwater basin. The inflow structure is subject to regulation by the EPA due to potential impacts to aquatic wildlife. The proposed solutions to these potential impacts include withdrawing water at such a rate as to allow wildlife to escape the intake structure or locating the intake structure outside areas of high biological productivity.
For the purposes of this analysis, we are assuming that an offshore intake pipeline would be installed along with an onshore pumping station located at the plant facility. This would allow the plant operators to control the speed of the pumping and the quantity of water being pulled through the intake system. A gate valve can be built to control the flow and a screening system can be installed to remove larger particles. For example, at the Sydney Desalination Plant (Sydney Desalination Plant, n.d.), a drum screen filters out particles that are 3 millimeters or more in diameter. The Sydney plant has their offshore structure 300 meters offshore with intakes resting on the ocean bed 25-30 meters below the surface. The intake rate is very low in order to not harm the nearby wildlife and they also built artificial reefs around the intakes.

It is assumed that the construction of the pipeline would be completed through one of the three trenchless methods: horizontal directional drilling (HDD), micro-tunneling, or auger boring. HDD requires that a pilot hole be created and once complete it is enlarged to fit the pipeline by “prereaming” it. The pipeline is then attached to the reamer which is connected to the drill string. A drilling rig is then used to pull the attached reamer and pipeline to the other side. Installing a pipeline via the micro-tunneling method encompasses utilizing “a remotely controlled micro-tunnel boring machine combined with the pipe jacking technique.” The auger boring method creates a bore hole using a rotating cutting head. HDD and micro-tunneling can lead to hydro-fracturing while auger boring has limitations on accuracy and where it can be used (City of Carlsband, 2005).

Pretreatment Facilities
Pretreatment is the first stage of the desalination process. When seawater arrives at the plant, it goes through a pretreatment process to remove particulates, debris, microorganisms, suspended solids and silt from the source seawater prior to reverse osmosis separation. In actuality, however, pretreatment systems remove most but not all of the suspended solids contained in the seawater. The suspended solids, particulates and silt that remain after pretreatment accumulate on the surface of the RO membranes and cause loss of membrane productivity over time. In addition, because seawater naturally contains bacteria as well as dissolved organics, a biofilm of bacteria can form on the membrane surface.

Two types of pretreatment systems are typically used to protect the SWRO membranes from fouling: conventional granular media filtration and membrane filtration. Currently, conventional granular media filtration is the predominant pretreatment technology for large and medium size desalination plants (Voutchkov, 2009). In this process, seawater is pumped into multimedia filter tanks, which typically include layers of anthracite and sand atop a bed of gravel (Figure 4). The filtered material is then separated out and pumped back to the ocean.
Before seawater enters the reverse osmosis filters to remove the salt particles, it must go through a second stage of pretreatment called microfiltration to remove smaller (oftentimes microscopic) impurities. At this point, virtually all impurities other than dissolved salts and minerals have been removed from the water, but it still needs to go through one more step to remove the dissolved salts and minerals to be ready for drinking. Once filtered, the water moves into the next stage of desalination.

Reverse Osmosis Treatment Facilities
The RO treatment is the center of the desalination process. RO systems leverage a semi-permeable membrane to remove ions, molecules, and unwanted contaminants and particles (salt in the case of desalination) from water. Reverse osmosis works by pushing water – under intense pressure – though semi-permeable membranes to remove dissolved salts and other impurities (Figure 5). High pressure pumps carry the water through the membranes. Much of the energy expended by the high-pressure pump is not used. Thus, an energy recovery device can be installed to reduce the total energy demand by 30%.
These membranes act like microscopic strainers that allow only water molecules to pass through, leaving behind the salt, minerals and other impurities such as bacteria and viruses. At the Tampa Bay Seawater Desalination Facility, the membrane pore size is 0.001 microns or 1/100,000th the size of a single human hair (Tampa Bay Water..., n.d.). At the Sydney Desalination Plant, there are 8 membranes per pressure vessel with a total of 36,000 membranes installed in the system (Sydney Desalination Plant). The size of the RO facilities will vary greatly depending on the water production capacity of the facility. For example, the Carlsbad Desalination Plant RO building contains more than 2,000 pressure vessels housing more than 16,000 reverse osmosis membranes.

Post Treatment Facilities
After the RO process, water typically undergoes chemical conditioning in product water post treatment facilities. Lime and carbon dioxide are used for post-treatment stabilization. The water then goes through a process called chloramination where chlorine is added in the form of ammonia and sodium hypochlorite to disinfect the water to the standards of the local health services standards.

Product Water Storage
Once the desalination process is complete, the water moves to storage tanks before being pumped to local water purveyors and blended with the regional water supply.

Chemical Storage and Handling Facilities
A wide range of chemicals are used extensively in the desalination and water treatment business (Williams, 2016). Substances used typically falling into one of two main groups. The first group, known as ‘online’ chemicals, includes coagulants, flocculants, chlorination and de-chlorination agents and biocides. The second group, often called ‘offline’ chemicals, includes a large number of somewhat stronger chemicals that can be used for a variety of
Nipomo Mesa Project

purposes such as dissolving the fouling that attaches to filtration membranes during operation.

Typically, various chemicals associated with the desalination process are stored on site. Some commonly stored chemicals include sodium hypochlorite, sodium hydroxide, sodium tripolyphosphate, sodium dodecylbenzene ammonia, lime, ferric sulfate, citric acid, and sulfuric acid. Chemicals must be stored in accordance with Federal, State, and local standards.

**Concentrate Management**

High levels of Total Dissolved Solids (TDS) concentrates (>65,000 mg/L) are produced by RO plants, which may also contain some toxic chemicals used during feedwater pretreatment and post-treatment. The concentrate from desalination (often referred to as brine) varies in composition and volume depending upon the nature of the source water. This makes Concentrate Management necessary to prevent significant environmental impact. Selection of management strategies depends on several factors: the concentrate volume and quality, the location of the desalination plant, and the pertinent environmental regulations. The following paragraphs explore examples of concentrate management practices often used, along with the benefits and drawbacks of each, then give recommendations based on the site specifics. The most used options are surface water discharge, submerged disposal, sewer disposal, deep well injection, land application, evaporation pools, and zeroliquid discharge (Handley, 2018).

**Surface Water Discharge.** This method involves disposing the concentrate in waterways adjacent to the plant including tidal rivers and streams, oceans, estuaries, or bays. Environmental concerns include long-term effects on the water quality of coastal aquifers and adverse impacts on the receiving waters’ ecosystems.

**Submerged Disposal.** In this method the concentrate is transported away from the desalination plant via underwater pipes to an estuarine and/or ocean location. Environmental concerns include potential impact of sinking briny concentrate on benthic marine organisms living on the sea bottom.

**Deep Well Injection.** Deep well injections greatly depend on the geological setting. For example, a porous layer and aquifer would be required near the site. Additionally, construction of deep injection wells can be costly. Depths vary among areas on how deep the well would need to go. An EPA permit is required to verify the well would be stable for injection. Lastly, groundwater quality could be impacted due to injection.

**Sewer Disposal.** Sewer disposal is a relatively inexpensive and straight forward disposal option. The liquid waste would be sent to a treatment plant used by the area. Options with this include concentrate discharge to the front or the back of the wastewater treatment
Nipomo Mesa Project plant. Discharge to the front is not recommended as conventional wastewater treatments do not remove TDS, which can result in significant impact on the biological treatment process of the wastewater. Discharge disposal to the end of the wastewater treatment plant mixes with the treated wastewater, resulting in a diluted concentrate. Drawbacks to this option include the cost of constructing an additional pipeline (and possibly a pump) connecting the two separate plants, as well as the possibility of adversely impacting receiving water despite the dilution. This may be a viable option for concentration disposal, as the Santa Maria Wastewater Facility is nearby, directly 12.5 driving miles southwest of the Nipomo Mesa Project site. Additional research into the impact of this process on receiving water is recommended. Correspondence with the wastewater treatment plant would also be needed to be assessed if the plant has the ability to integrate with the desalination plant.

**Evaporation Ponds** are another option, constructed with liners and allow water evaporation while the salts accumulate at the bottom of the pond. These ponds are cost effective and demand low energy input, but are best suited for arid regions, as moist air will decrease evaporation rates. The main problems with evaporation ponds is the large area needed to hold the substantial volumes of liquid. The ponds must be at a shallow depth to allow for evaporation, causing small volumes to be held even when using large areas. In recent years, technology has been developed to decrease the land area needed for ponds, which may be explored for the Nipomo Mesa Project site. Monitoring is essential for this process due to the exposure to wildlife. There is also a risk of groundwater contamination due to pool leakage.

**Land Application.** This method involves application of the concentrate to salt-tolerant crops or vegetation. Feasibility of this method depends on the local climate, land availability, location of the groundwater table, and vegetation tolerance to salinity.

**Brine Concentrators.** Technologies such as brine concentrators are relatively new but promise large scale minimization in brine discharge volumes by extending the range of RO filtering membranes to that of thermal evaporation. This process uses heat exchangers, deaerators, and vapor compressors to convert the traditional liquid concentrate produced to a more slurry, concentrated form. With this technology, brines can be concentrated up to 130,000 mg/L, which minimizes the total amount of brine being sent out for disposal. Downsides to this method including locating a disposal site for high concentrates of salts, ions, and chemicals and increased energy requirements to accomplish this methodology.

**Zero liquid discharge.** The zero liquid discharge method is another fairly new technology that employs an evaporation process to turn brine into a dry solid. This process would not be best suited for this project because it is extremely energy intensive, expensive, and pairs the best with thermal desalination technologies, not reverse osmosis.
The environmental constraints analysis section below will focus on the submerged disposal option for concentrate management. Reasons for this include:

- It is one of the most common methods in practice at other existing desalination plants.
- Under the Desalination Amendment to the California Water Resources Control Board, if the toxicity levels in concentrated discharge are below recently established thresholds, submerged disposal would be considered acceptable with mitigation applied.

**Distribution**

The Nipomo Mesa Project will be designed to deliver freshwater for domestic consumption, landscaping, agricultural uses, and potentially ecological restoration of impaired local freshwater streams. The extent and location of distribution pipelines is unknown at this time and will not be included as part of the environmental constraints analysis.

**Ecological Restoration Components**

The ecosystems of the Nipomo Mesa Project site include coastal dunes, freshwater lakes, wetlands, and marshes. The ecosystems have similar threats from intensive recreation and invasive species. Restoration efforts will be directed towards improving the environmental and ecological condition of the degraded dune habitat and the degraded Little Oso Flaco Creek. The primary components of the ecological restoration phase are outlined in the paragraphs below.

**Dune Habitat Restoration**

Dune restoration typically begins with the removal of over-stabilizing invasive vegetation. In many cases, that action alone is sufficient to return the system to the point where native species can recolonize, and communities can recover (National Park Service, 2020). In other cases, more intensive intervention is needed. Often in these cases, fencing will accompany the planting of native species. Sand fences help promote effective dune formation (U.S. Fish and Wildlife, 2020). All dune restoration efforts will measure success with regular monitoring and maintenance (Doody, 2012).

**Little Oso Flaco Creek Restoration**

The USDA Guidance for Stream Restoration lists nine steps for a successful restoration effort.

1. Identify problems and opportunities
2. Determine overall goals and specific objectives
3. Inventory resources
4. Analyze resource data
5. Formulate alternatives
The purpose of the stakeholder analysis is to identify and outline all potential and existing stakeholders of the Nipomo Mesa Project. By listing potential and existing stakeholders early in the Environmental Impact Report process, we are better able to obtain necessary guidelines, restrictions, permits, and approvals prior to project initiation. DUNES Environmental Group has included land management agencies, regulatory agencies, NGO’s, private landowners, business/industry groups, technical experts, community groups, project proponents and beneficiaries, and tribal organizations. We have outlined each stakeholders’ concerns, any potential conflicts that may arise, goals and benefits, as well as their potential involvements in the Nipomo Mesa Project (Table 2). We have conducted extensive research on local, state, and federal agencies in order to have a complete framework of all key players in the Nipomo Mesa Project. All stakeholders listed in the matrix below will be affected by or involved with the environmental, social, or financial effects that the Nipomo Mesa Project...
causes. This written report has clarified which groups will be involved, their interests, level of involvement, and at what point in the process their involvement will occur.

Table 2. Table describing potential Federal, State, and Local stakeholders.

<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Goals/Benefits and Concerns/Conflicts</th>
<th>Potential Role/Contribution</th>
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<tbody>
<tr>
<td><strong>Federal Agencies</strong></td>
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<tr>
<td>United States Army Corps of Engineers (USACE)</td>
<td>Ensuring the construction and permitting plans do not infringe on jurisdiction of navigable waters. Their main concern is with environmental sustainability.</td>
<td>Issue permits for construction of facilities within navigable waters, if applicable.</td>
</tr>
<tr>
<td>National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries)</td>
<td>NOAA Fisheries is mainly concerned with the protection or marine fish and mammal species by administering the regulations listed in the ESA, Marine Mammal Protection Act, and the Magnuson-Stevens Fishery Management and Conservation Act. Their involvement would depend on whether or not the Nipomo Mesa Project would result in disturbance of oceanic wildlife.</td>
<td>Their involvement would depend on whether the Nipomo Mesa Project would result in disturbance of oceanic wildlife. If involved, they would provide support and information that would help to conserve and manage coastal and marine ecosystems and natural resources.</td>
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<tr>
<td><strong>State Agencies</strong></td>
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<tr>
<td>California Regional Water Quality Control Board-Region 3 (RWQCB)</td>
<td>The responsibility of the RWQCB is to protect quality of surface and groundwater within the Central Coast Region. Their main concern would be with any potential industrial waste discharge, contamination, and/or pollution on the site.</td>
<td>If the Nipomo Mesa Project is approved, USACE will not be able to begin construction without first consulting with RWQCB regarding water quality in the Nipomo Mesa Project area.</td>
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<td>Stakeholder Name</td>
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<tr>
<td>California Coastal Commission</td>
<td>The CCC’s primary concern is with the regulation of development projects along the coastline under the authority of the California Coastal Act.</td>
<td>The Nipomo Mesa Project, if approved by the county, will need to be approved by the CCC. They will provide support in ensuring that all shoreline access, water quality assessments, transportation, and construction activities do not harm nearby Environmental Sensitive Habitat Areas (ESHAs) along the coastal zone.</td>
</tr>
<tr>
<td>California State Lands Commission (CSLC)</td>
<td>The CSLC is concerned with submerged tidelands along the California coast as well as beds of navigable waters. If construction is found to fall within the CSLC jurisdictional land, a land lease would be needed to continue. Their goal is to protect and preserve natural habitats from harmful activity and invasive species.</td>
<td>They would help to ensure that the Nipomo Mesa Project does not harm natural habitats from harmful activity and invasive species.</td>
</tr>
<tr>
<td>California Department of Health Services (DHS)</td>
<td>The DHS is concerned with the quality of water once it is in storage and distribution systems to ensure the health of surrounding communities.</td>
<td>Once completed, the DHS would play a large role in ensuring and maintaining the quality of the water processed and distributed at the Desalination plant and that it falls within a set of health standards that are safe for public use and consumption.</td>
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<tr>
<td>Stakeholder Name</td>
<td>Goals/Benefits and Concerns/Conflicts</td>
<td>Potential Role/Contribution</td>
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<tr>
<td>California Department of Fish and Wildlife (CDFW)</td>
<td>Their main goal is to enforce federal wildlife laws and to protect endangered species and important habitat. They could have the potential to slow development of the Nipomo Mesa Project due to the surrounding sensitive habitats at the site.</td>
<td>They would review the Nipomo Mesa Project for any potential impacts to federally and state listed threatened or endangered species upon request by the USACE. More specifically, they would review impacts of the desalination plant on Western snowy plover or Least tern populations. Will also make sure the rehabilitation areas are up to standards.</td>
</tr>
<tr>
<td>California State Water Resource Board</td>
<td>Concerned about water quality and construction runoff into the Ocean. Their goal is to ensure that water quality meets set standards and limit the number of pollutants that enter and leave the Nipomo Mesa Project site.</td>
<td>Their role will be to provide regulation knowledge standards to agencies involved and assist with any and all water management at the site.</td>
</tr>
<tr>
<td>California Environmental Protection Agency (CalEPA)</td>
<td>Oversee project implementation and activities in relation to required permits. Their goal is to restore, protect, and enhance the environment and to ensure public health as well as environmental and economic quality and feasibility.</td>
<td>Development, implementation, and enforcement of environmental policies that will regulate waste reduction as well as water, soil, and air quality at the site and in surrounding areas.</td>
</tr>
<tr>
<td>Cal Fire</td>
<td>Goal and main concerns are fire safety and the subsequent protection of community members and natural resources from catastrophic wildfire events.</td>
<td>Ensure that there are proper fire safety precautions taken and adequate infrastructure available at all stages of project development.</td>
</tr>
<tr>
<td>Stakeholder Name</td>
<td>Goals/Benefits and Concerns/Conflicts</td>
<td>Potential Role/Contribution</td>
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<tr>
<td><strong>Pacific Gas and Electric Company (PG&amp;E)</strong></td>
<td>PG &amp; E is concerned about project energy use and power supply. Energy conservation and power supply efficiency is their mission.</td>
<td>Will be involved in the power supply for the desalination plant. Will potentially support energy conservation efforts regarding the Nipomo Mesa Project.</td>
</tr>
<tr>
<td><strong>California Department of Parks and Recreation</strong></td>
<td>Mission is to provide recreation and education to California citizens to help preserve natural and cultural resources. They would be concerned with potential affects to the nearby Oceano Dunes State Vehicular Recreational Area. They may also feel the Nipomo Mesa Project conflicts with the alternative project proposal to turn the Phillips 66 Land into a state park.</td>
<td>In tandem with CDFW and tribal governments, may provide support and other resources regarding the preservation of tribal resources, historic resources, and sensitive habitats that may be present in or around the Nipomo Mesa Project site.</td>
</tr>
<tr>
<td><strong>Local Agencies/Groups</strong></td>
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<tr>
<td><strong>County of San Luis Obispo</strong></td>
<td>Permitting agency under CEQA and would play a large role in permitting. Would ensure the Nipomo Mesa Project complies with County’s General Plan and Land Use Ordinances.</td>
<td>Will analyze the Nipomo Mesa Project to determine the consistency of applicable standards or policies.</td>
</tr>
<tr>
<td><strong>San Luis Obispo County Air Pollution Control District (APCD)</strong></td>
<td>Concerned with protecting health of county residents by preserving air quality. Might be concerned with air pollution released during construction activities and when the plant is fully operational.</td>
<td>Would be an active member in determining whether the Nipomo Mesa Project is compliant with Federal, State, and local air quality criteria.</td>
</tr>
<tr>
<td><strong>San Luis Obispo County Division of Environmental Health</strong></td>
<td>Local approval agency for issuance of water supply well permits or injection wells within a drinking water aquifer.</td>
<td>Will play a role in ensuring adequate separation of water supply wells from wastewater disposal facilities. Will play a role in permitting and that the plant meeting drinking water standards.</td>
</tr>
<tr>
<td>Stakeholder Name</td>
<td>Goals/Benefits and Concerns/Conflicts</td>
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<tr>
<td>Central Coast Economic Recovery Initiative</td>
<td>Coalition of elected officials and community leaders with a goal to stimulate post-pandemic economic recovery with a focus on clean energy and infrastructure investment. Goal is to get the Nipomo Mesa Project approved. Some conflicts may arise from some members being involved in local government and community boards.</td>
<td>Will oversee the Nipomo Mesa Project approval process and implementation of the Nipomo Mesa Project if approved and all subsequent actions necessary.</td>
</tr>
<tr>
<td>Cal Poly Institute for Climate Leadership and Resilience</td>
<td>Goal is to study and locate areas in the local community where major changes can be made to bolster the economy, protect infrastructure, and find solutions to local environmental challenges. Members of the group are project originators, which could be a source of conflict.</td>
<td>Will help to provide research and information to project developers regarding mitigation strategies for climate reliance. Will also provide support and information regarding community health strategies, environmental and social justice, as well as economic development.</td>
</tr>
<tr>
<td>Oceano Economic Development Council</td>
<td>Concerned with job creation and prosperity in Oceano. Aims to revitalize Oceano as a beach community with a thriving economy while maintaining and conservancy of cultural and historical significance.</td>
<td>Will likely be involved with economic impact of the Nipomo Mesa Project, and the opportunity for job creation throughout the Nipomo Mesa Project construction and implementation.</td>
</tr>
<tr>
<td>Indigenous Groups</td>
<td>Concerned with protection of cultural resources, artifacts, and habitats. If found within project site, mitigation strategies or complete project changes may be necessary.</td>
<td>They will assist in documentation and monitoring of any activity if such resources are found in preliminary studies. Potential to be involved with co-management strategies.</td>
</tr>
</tbody>
</table>

Student Work Product - For Informational Purposes Only
<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Goals/Benefits and Concerns/Conflicts</th>
<th>Potential Role/Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>San Luis Obispo Land Conservancy</strong></td>
<td>Goal is to work collaboratively with landowners and government agencies to find solutions to conflict. Prevents poorly planned development, protects drinking water, and restores wildlife habitats. Will be concerned with potential for project to infringe upon habitats and nearby private landowners.</td>
<td>Will work mostly with the reparation aspect of the Nipomo Mesa Project in conserving habitats on the site and ensuring that proper restoration, stewardship, and monitoring occurs.</td>
</tr>
<tr>
<td><strong>Central Coast Community Energy</strong></td>
<td>Agency established to source clean and renewable electricity. Main goals are to reduce greenhouse gas commissions and promote long term electric stability and security.</td>
<td>Will provide insight and information on best practices in the planning of the desalination plant to best mitigate greenhouse gas emissions. May also play a role in economic development.</td>
</tr>
<tr>
<td><strong>San Luis Obispo Climate Coalition</strong></td>
<td>Goal is to use community expertise to find regional climate solutions. Concerned with environmental justice, economic vitality, and climate resilience. Have a large network of community members, climate and energy professionals, policymakers, local officials, and business leaders.</td>
<td>Will play a role in influencing political stakeholders. Could also play a part in utilizing community knowledge to inform decision-making regarding site plans.</td>
</tr>
<tr>
<td><strong>Citizens of Surrounding Community</strong></td>
<td>Community members, energy users, water users, agricultural entities, businesses, and others may be concerned with noise, traffic, environmental management, aesthetics, public health, and more both during and after construction.</td>
<td>Will have a voice on the approval of the Nipomo Mesa Project throughout the process through public comment sessions, voting opportunities, and other public engagement.</td>
</tr>
</tbody>
</table>
Environmental Constraints Analysis

Methodology

The compiled information in this constraints report was completed through an expansive literature analysis and the background expertise of the team. A primary point for review and evaluation was comparisons to existing desalination plants and their associated planning. Chief among these was the Carlsbad Desalination Plant which served as a point of reference for certain assumptions made in the document. Furthermore, extensive research was done into the various permitting concerns related to federal, state, and local agencies. Lastly, was the researching the issues areas consistent with CEQA guidelines for evaluation. Namely these were: biological resources, cultural resources, geology and soils, and recreational resources discussed below.

Environmental Issue Area 1: Biological Resources

Issue Area Description
This section summarizes the common and sensitive vegetation, wildlife, and aquatic biological resources that are known to or have the potential to occur within the Nipomo
Nipomo Mesa Project site. Biological resources include vegetation and habitat types, sensitive plant communities, and special status plant and animal species.

In evaluating biological resources, the Nipomo Mesa Project area is where any temporary and/or permanent ground disturbance will take place. The survey area refers to the 1,780-acre parcel adjacent to State Highway 1 in Arroyo Grande (Nipomo Mesa), California. Currently 200 acres are being used for industrial activities while the rest is used for grazing and other non-industrial use (Phillips 66, n.d.).

This analysis of biological resources is based on review of existing biological databases and site visits. Discussion of existing biological resource conditions is based on data gathered from the California Natural Diversity Database, CDFW and USFW wildlife surveys, and surveys done by Padre associates, CalFlora and Google maps. The Jepson eManual was also consulted for plant descriptions.

The discussion will focus on those species and habitats that are considered “special status” which are defined for the purposes of this assessment as" those that are listed, are proposed for listing, or are candidates for listing as threatened or endangered under the Federal Endangered Species Act or the California Endangered Species act (USFWS)."

**Oceano Dunes District Habitat Conservation Plan (HCP)**

The California Department of Parks and Recreation is currently in the process of creating a Habitat Conservation Plan for the Oceano Dunes District. The HCP is part of the Department of Parks and Recreation’s application for an Incidental Take Permit (section 10 (a)(1)(B)) since management of Pismo State Beach and Oceano Dunes State Vehicular Recreation Area (SVRA) affects federally/state listed species (California State Parks, 2020). The plan is still in the drafting stages with the latest document released in November of 2020. The draft EIR and Environmental Assessment (EA) are also available to the public on their Oceano Dunes District HCP website (https://www.oceanoduneshcp.com/). It is important to stay up to date on the HCP because of its potential to impact the Nipomo Mesa Project once it is finalized. The HCP can affect where pipelines are to be located and other components of the Nipomo Mesa Project.

**Present Habitats**

**Dune Scrub**

Dune scrub is the dominant plant community that is present within the Nipomo Mesa Project boundaries (Figure 6). It is mainly found on the west side where the dunes are located, and the property borders the Oceano Dunes SVRA, but it does occur to east of the SMF as well. Some of the species that can be found within the plant community are as follows: California sagebrush (*Artemisia californica*), buckbrush (*Ceanothus cuneatus*), sea cliff buckwheat
Nipomo Mesa Project contains a variety of plant species. These include beach blue lupine (Lupinus chamissonis), black sage (Salvia mellifera), San Luis Obispo monardella (Monardella undulata), and beach sand verbena (Abronia umbellata) (CalFlora, n.d.). There are many other species that are present; CalFlora’s website displays that over 180 species grow throughout the sand dune areas of the Nipomo Mesa Project site (CalFlora, n.d.).

**Annual Grasslands**
Parts of the Nipomo Mesa Project area contain some grasslands and are predominantly found to the east of the SMF (Figure 6). This community is typically dominated by non-native grasses because of the various disturbances that have occurred. The invasive veldt grass is a predominant invasive species within this plant community. (Marine Research Specialists, 2014)

**Woodlands**
As pointed out by the Phillips 66 Rail Spur EIR, there are areas within the Nipomo Mesa Project boundary where trees are present creating small woodlands. Running parallel to the Union Pacific Railroad, a Eucalyptus windrow is present creating a small habitat for creatures; the windrow is solely composed of blue gum eucalyptus (Eucalyptus globulus). In addition, throughout the parcels there are a few individual coast live oaks (Quercus agrifolia) within the dune scrub; they do not create an oak woodland because of their small numbers. Lastly, small groups of Monterey pine (Pinus radiata) are present throughout the site. (Marine Research Specialists, 2014)

**Riparian**
Along Oso Flaco Creek, riparian habitat dominated by willows is present (Marine Research Specialists, 2014). The corridor is south of the Nipomo Mesa Project boundary, flowing into Little Oso Flaco lake. In addition, both Little Oso Flaco and Oso Flaco lake have riparian habitats (California State Parks, 2020).

**Marine**
Adjacent to the site along the Central Coast are marine habitats, consisting of marine mammals such as the Southern Sea Otter, fishes such as the Tidewater Goby, and plants such as the endemic Eel grass (USFWS, IPaC, n.d.).

**Wetlands**
Within the Nipomo Mesa Project boundary, there are a total of nine wetlands according to the US Fish and Wildlife’s National Wetlands Inventory (Figure 7 & 8). The US Fish and Wildlife Service defines a wetland as “lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water” (Tiner, 1997). Each wetland is typed and classified by the agency; classifications vary based on the system, vegetation class and subclass, and the water regime (USFWS, National
Nipomo Mesa Project Wetlands Inventory, n.d.). The two wetland types present are freshwater emergent and freshwater forested/shrub. Each is further classified as one of the following: PEM1A, PEM1C, PSS1A, or PSS1C (Table 3 & Figure 8)

Table 3. Classification Code for Wetlands by the National Wetlands Inventory

<table>
<thead>
<tr>
<th>Classification</th>
<th>System</th>
<th>Class</th>
<th>Subclass</th>
<th>Water Regime</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEM1A</td>
<td>Palustrine (P)</td>
<td>Emergent (EM)</td>
<td>Persistent (1)</td>
<td>Temporary Flooded (A)</td>
</tr>
<tr>
<td>PEM1C</td>
<td>Palustrine (P)</td>
<td>Emergent (EM)</td>
<td>Persistent (1)</td>
<td>Seasonally Flooded (C)</td>
</tr>
<tr>
<td>PSS1A</td>
<td>Palustrine (P)</td>
<td>Scrub-Shrub (SS)</td>
<td>Broad-leaved deciduous (1)</td>
<td>Temporary Flooded (A)</td>
</tr>
<tr>
<td>PSS1C</td>
<td>Palustrine (P)</td>
<td>Scrub-Shrub (SS)</td>
<td>Broad-leaved deciduous (1)</td>
<td>Seasonally Flooded (C)</td>
</tr>
</tbody>
</table>
Figure 6. Vegetation within the Nipomo Mesa Project boundary and sensitive areas
Figure 7. Wetlands within the Nipomo Mesa Project Boundary
Figure 8. Classification of the wetlands within the Nipomo Mesa Project boundaries
Environmentally Sensitive Habitat Area (ESHA)

The San Luis Obispo Local Coastal Program (LCP) along with the California Coastal Commission have designated “almost the entire Oceano Dunes as ESHA” (Engel et al. 2021). This classification indicates that the area contains species or habitat that is rare or valuable because of the role they play and can be affected by development, per the Coastal Commission definition (Engel et al. 2021). Therefore, most of the Oceano Dunes has been designated as ESHA because of the various habitats and plant species it contains which play an important role in their ecosystem.

Endangered and Threatened Species

In the summary table provided below (Table 4) is a list of all the endangered, threatened, or special status plants and wildlife that are known to occur within the Nipomo Mesa Project site boundaries. A detailed discussion of the species’ is provided in the appendix section (Appendix A), and provides information on federal and state listing status, reasoning for listing, and known range of each species.

Table 4. List of endangered, threatened, or special status species known to occur within the Nipomo Mesa Project site boundaries.

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plants</strong></td>
<td></td>
</tr>
<tr>
<td>California Jewelflower (Caulanthus californicus)</td>
<td>Endangered</td>
</tr>
<tr>
<td>Gambel’s Watercress (Rorippa gambelii)</td>
<td>Endangered</td>
</tr>
<tr>
<td>La Graciosa Thistle (Cirsium loncholepis)</td>
<td>Endangered</td>
</tr>
<tr>
<td>Marsh Sandwort (Arenaria paludicola)</td>
<td>Endangered</td>
</tr>
<tr>
<td>Nipomo Mesa Lupine (Lupinus nipomensis)</td>
<td>Endangered</td>
</tr>
<tr>
<td>Salt Marsh Bird’s-beak (Cordylanthus maritimus ssp. maritimus)</td>
<td>Endangered</td>
</tr>
<tr>
<td>Spreading Navarretia (Navarretia fossalis)</td>
<td>Threatened</td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
</tr>
<tr>
<td>Western Snowy Plover (Charadrius alexandrinus)</td>
<td>Threatened</td>
</tr>
<tr>
<td>California Least Tern (Sterna antillarum brownii)</td>
<td>Endangered</td>
</tr>
<tr>
<td>Least Bell’s Vireo (Vireo bellii pusillus)</td>
<td>Endangered</td>
</tr>
<tr>
<td>Marbled Murrelet (Brachyramphus marmoratus)</td>
<td>Threatened</td>
</tr>
<tr>
<td>Southwestern Willow Flycatcher (Empidonax traillii extimus)</td>
<td>Endangered</td>
</tr>
<tr>
<td><strong>Invertebrates</strong></td>
<td></td>
</tr>
<tr>
<td>Monarch Butterfly (Danaus plexippus)</td>
<td>Sensitive</td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
</tr>
<tr>
<td>Giant Kangaroo Rat (Dipodomys ingens)</td>
<td>Endangered</td>
</tr>
<tr>
<td>Pallid bat (Antrozous pallidus)</td>
<td>Species of Special Concern</td>
</tr>
</tbody>
</table>
Species Name | Status
--- | ---
Amphibians and Reptiles
California red-legged frog (*Rana aurora draytonii*) | Threatened
Coast horned lizard (*Phrynosoma coronatum frontale*) | Species of Special Concern
Southwestern pond turtle (*Clemmys marmorata pallida*) | Species of Special Concern
Two-striped garter snake (*Thamnophis hammondii*) | Species of Special Concern
Blunt-nosed Leopard Lizard (*Gambelia silus*) | Endangered
California Tiger Salamander (*Ambystoma californiense*) | Threatened
Fish
Tidewater Goby (*Eucyclogobius newberryi*) | Endangered

Potential Environmental Constraints and Recommendations
This section describes the impacts the Nipomo Mesa Project may have on the biological resources within the Nipomo Mesa Project area. Impacts addressed include issues such as permanent and temporary effects on vegetation, habitats, and special status species. Impacts have been evaluated and estimated in comparison to the existing condition of the Nipomo Mesa Project site, as described in the Biological Resources Existing Conditions section above. Thresholds of significance were applied to potential impacts to determine the predicted approximate significance of the impact. Quantitative and definite data on the potential impacts the Nipomo Mesa Project will have on biological resources would need to be obtained through focused botanical surveys, vegetation community mapping, wildlife inventory surveys, and ESHA habitat surveys, performed by licensed professionals.

The predicted impacts are compiled in the tables below. Each table contains a brief impact statement, a preliminary statement of impact significance, a deeper discussion on the constraints regarding the impact, and recommendations for project managers accordingly. The impacts are broken up into three sections: the Nipomo Mesa Project site construction phase (A), the operational phase (B), and the restoration phase (C). Descriptions of each phase are discussed in further detail in the Nipomo Mesa Project description section of the report.

Impacts associated with construction activity are based on information provided by U.S. Fish and Wildlife Service, the EIR for the Carlsbad Desalination Plant, the Oceano Dunes EIR, the Pismo Beach and Oceano Dunes Public Works Plan, and the NCSD Desalination Plant Technical Memorandum.
Impact Prediction Methodology

In accordance with Appendix G of the CEQA Guidelines, and in conjunction with federal, state, and local regulations, the impacts to biological resources would be considered significant if the Nipomo Mesa Project would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

A. Project Site Construction Phase

The assessment of impacts due to construction activity is based on the presence of machinery and its associated impacts, such as noise, dust, and disturbance of vegetation.

<table>
<thead>
<tr>
<th>Biological Resources Impact A1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction activities within the Nipomo Mesa Project site such as cutting, filling, grading, and paving would result in substantial adverse effects on special-status terrestrial, plant, and avian species potentially occurring in the Nipomo Mesa Project area.</td>
</tr>
</tbody>
</table>


Constraint Discussion
All construction activities would directly impact, either temporarily or permanently, any existing vegetation that is present on the site at the time of construction. Habitat loss and conversion is not a primary concern because the construction of the desalination facility will take place within the area the SMF is currently located in. Instead, the potential for impacts on species and their habitat comes from where the intake and discharge pipes are constructed. The desalination plant is expected to receive water from the coast and release brine into the ocean or estuary; as a result, pipelines are needed and would be placed beneath the sand dune habitat since it is adjacent to the ocean, in between the SMF area and the water source. This has the potential to disrupt individuals of the listed plant species and their habitat. Pipeline construction may lead to soil disturbance affecting the entire habitat and/or individual species. Vehicle, equipment, and worker movement within or around the areas these listed species occur may also have an impact; the movement can disturb individuals and may also have the potential of introducing nonnative species.

Any cutting, filling, or grading would directly affect any Giant Kangaroo Rat, California Tiger Salamander, Red-legged Frog, Blunt-nosed Leopard Lizard, and Burrowing Owl populations and habitats. The installation of a pipeline could result in disturbance of sensitive terrestrial species that rely on shrub/scrub vegetation communities, woody wetlands habitats, grasslands, marine habitat, and ESHA areas nearby (see figure 3). Any runoff from construction site could affect sensitive aquatic species, such as the California Tiger Salamander, the Two-Striped Garter Snake, Southwestern Pond Turtle, California Red-Legged Frog, the Tidewater Goby, and other water-dependent species. Furthermore, human foot traffic, vehicle use, and other construction activities have the potential to disrupt habitats and species (Carlsbad Seawater Desalination Facility EIR).

**Recommendations**

It is recommended to have an in-depth survey of the terrestrial, aquatic, and avian species present prior to construction to mitigate damage to on-site vertebrate species. It would be in the best interest of the project planners to avoid installing a pipeline anywhere near the nearby ESHA land or otherwise protected lands with sensitive species. A detailed survey would need to be done regarding marine species, specifically looking for Eel grass or any other sensitive species that could be affected by runoff or other construction activities. It is in the best interest of the project planner to completely avoid all take of the sensitive species listed, as defined under the Endangered Species Act, unless permitted to do so.

It is also recommended that a botanical survey be conducted. The survey is needed to get a better representation of the plant species and communities present, where they occur, and the density of vegetation cover. It will also assess the extent of rare, threatened, and endangered species present. By completing a botanical survey, the impacts on plant species and their habitats will be evaluated better. With this
Biological Resources Impact A1
information, pipeline alignments can be better planned to avoid or minimize disturbances to rare, threatened, and endangered species. The California Native Plant Society website has guides on how to conduct a botanical survey for vegetation and rare plants. In addition, they have linked resources to other agency websites about botanical survey methods (California Native Plant Society, 2020).

The following mitigation measures should be considered: hiring a biologist, training construction workers about the sensitive habitats and species in the Nipomo Mesa Project site, measures to avoid and minimize impact to listed terrestrial, aquatic, and plant species, control measures for nonnative plants, and minimizing construction impacts on sensitive habitats (Carlsbad Seawater Desalination Facility EIR).

Biological Resources Impact A2
Construction activities within the Nipomo Mesa Project boundary would have adverse effects on wetlands and riparian habitats identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service. This phase would not have substantial adverse effects on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means. Mitigation measures have the potential to decrease the impact.


Constraint Discussion
The Nipomo Mesa Project would primarily have adverse effects on the ESHA within and adjacent to the Nipomo Mesa Project boundary, as designated by the County of SLO and the Coastal Commission, during the construction phase. As previously explained, intake and discharge pipelines have to be constructed for the desalination plant which would go under the sand dunes designated as ESHA. The critical habitat designated for La Graciosa thistle will also be impacted as most of the sand dunes within the Nipomo Mesa Project boundary is designated habitat for the species.

The removal and filling of the wetlands is not a concern as the desalination plant will be located in the area the SMF is currently at. Instead, the wetland areas may potentially be impacted by the pipelines if constructed beneath them. These three habitats have the potential to have soil disturbance because of the pipeline implementation. Construction equipment may also impact the habitats during the building of the pipelines either directly or indirectly. Nonnative species may be introduced to the area as a result of vehicle, equipment, and worker movement within or around the habitats.
**Biological Resources Impact A2**

Surrounding sensitive habitats also include the riparian corridors of Santa Maria River and Nipomo Creek. Riparian habitats are sensitive to changes in runoff, groundwater tables, spatial extent of the habitat, changes in biotic interactions, changes in sediment erosion and deposition, and any increase in pollutants. The sensitive species found in the Riparian habitats found within and around the site include the Western Pond turtle, two-striped garter snake, California red legged frog, Swainson’s hawk, and Least bell’s vireo (California Department of Fish and Wildlife).

Possible site construction activities, including but not limited to pipeline excavations and trenching and horizontal directional drilling operations, incidental spills or leaks of oils or fluids from equipment and machinery may result in a pollutant discharge into the Santa Maria River corridor and floodplain, and associated riparian habitats. These spills or discharges would have the potential to result in direct impacts to the species listed above, specifically the aquatic-dependent species such as the California red-legged frog, through pollution, degraded water quality, increased turbidity, and habitat destruction (Nipomo Community Services District Technical Memorandum).

The construction of buildings may have the potential to fragment riparian habitats which would result in increased edge effects for existing communities of terrestrial and aquatic species.

The general human traffic, tool use, vehicle use, and waste that comes with construction activities also has the potential to affect riparian habitats (Nipomo Community Services District Technical Memorandum).

**Recommendations**

As previously mentioned, it is recommended that a botanical survey of the vegetation be conducted; the botanical survey recommendation for impact A1 also apply to this impact.

In addition, a wetland delineation should be conducted to determine the location of the sensitive habitats. The 1987 Corps of Engineers Wetlands Delineation Manual should be used to identify the wetland boundaries. Other resources for this survey can be found on the NRCS’s website page, “Identifying Wetland Boundaries,” and on the state of Washington’s department of ecology website page, “Wetland delineation resources.” By conducting the delineation, the impacts to the sensitive area can be better evaluated; pipeline construction can be planned better to avoid or minimize the impact as well. The survey can provide information as to if the pipelines will have the potential to impact the wetlands hydrology.

A mitigation measure that should be considered is implementing a wetland mitigation and monitoring plan to minimize impacts. The plan should include the delineation,
### Biological Resources Impact A2

depths, current setting, criteria for creation or enhancement of wetland, and the method that will preserve the site permanently. (Monterey Desal EIR)

A thorough wildlife survey should also be conducted to identify all sensitive species and habitats that fall within project boundaries. This survey will inform all construction activities and best management practices.

It is recommended that an analysis regarding pipeline placement be conducted to avoid impacting the wetlands and riparian habitats. Different pipeline routes should be evaluated for their impacts to determine which will have the least impact on the ESHA as well as the wetlands and riparian communities.

Mitigation measures that should be considered include hiring a biologist, training construction workers about the sensitive habitats, control measures for nonnative plants and wildlife, and minimizing construction impacts on sensitive habitats. (Monterey Desal EIR)

### Biological Resources Impact A3

Construction activities within the Nipomo Mesa Project boundary have the potential to Interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors.


**Constraint Discussion**

The main concern associated with effects of construction on migratory species are regarding the Least tern, the Snowy Plover, and their protected habitat West of the site. Effects of construction on these species, and other sensitive species is not a large concern as the desalination plant will be in the area that the SMF is currently located at. The Nipomo Mesa Project has no need to interfere with their habitats or migration corridors. Instead, impacts to the migratory species will arise if the pipelines are constructed close to or beneath their habitats and/or migration corridors.

Furthermore, if any eucalyptus trees are cut down during construction, there lays a risk for harming Monarch butterfly habitat. While these migration paths and habitats may not directly be impacted, indirect effects can occur. The movement of vehicles, equipment, and workers may indirectly impact the adjacent wetlands.

**Recommendations**

It is recommended that detailed surveys on the Snowy plover and Least tern should be conducted to delineate their migratory corridor and whether they will be present within the construction site at any time. There should also be a survey done regarding other migratory species that can be found within the site boundaries.
Mitigation strategies can include only doing construction during times of year when migratory species are not present in the Central Coast. Furthermore, educating construction workers and managers on sensitive migratory species will be necessary.

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The construction phase would have conflicts with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.


**Constraint Discussion**

The following policies under Title 23-Coastal Zone Land Use from the County of San Luis Obispo are applicable to the Nipomo Mesa Project: 23.07.170 (Environmentally Sensitive Habitats), 23.07.172 (Wetlands), 23.07.176 (Terrestrial Habitat Protection), and 23.07.178 (Marine Habitats).

**23.07.170 – Environmentally Sensitive Habitats**

This ordinance by the County of SLO states that permits for projects within or adjacent to environmentally sensitive habitats shall only be granted if there are no significant negative impacts, the “use will be consistent with the biological continuance of the habitat,” and no significant disruptions to the habitat occur (SLO Ordinance). While the desalination plant will be constructed on the same area the SMF is currently located on, the construction of the pipelines may have the potential to impact and disturb the sensitive habitat. Since the pipelines will be running beneath the dunes, the construction of them through trenchless methods may have the potential to disrupt the soil possibly leading to a significant impact and disturbance. Therefore, it is possible that the Nipomo Mesa Project can conflict with this ordinance.

**23.07.172 – Wetlands**

The Wetlands ordinance requires that any project conducted near a wetland be at least 100 feet away from it. The Nipomo Mesa Project’s desalination plant will be located at a greater distance than 100 feet from the nearest wetland which will not be conflict with the ordinance. Instead, the construction of the pipelines may conflict with the 100 feet buffer. If the pipelines are to be constructed underneath where the wetlands are located, the Nipomo Mesa Project may not be in line with the ordinance. The ordinance does allow for a smaller buffer with the minimum being 25 feet away and compliance with the outlined requirements. If a smaller buffer is approved mitigation measures will be required.

**23.07.176 – Terrestrial Habitat Protection**

The purpose of the Terrestrial Habitat Protection is to conserve the habitat of rare and endangered species in an effort to protect them from further disturbance. The
Biological Resources Impact A4

Construction phase of the Nipomo Mesa Project, specifically the pipeline construction, may impact the habitat of listed species, but with mitigation measures the effects could be reduced. Therefore, the Nipomo Mesa Project construction phase does not conflict with this ordinance.

23.07.178 – Marine Habitats
The Marine Habitats ordinance was set in place to protect the habitats of aquatic life. The ordinance does not restrict the construction of pipelines to the ocean and instead details that impacts should be avoided and minimized. While the pipelines for the Nipomo Mesa Project will impact marine habitat to an extent, mitigation measures should be implemented to comply with the ordinance. With mitigation the Nipomo Mesa Project may not conflict with the ordinance.

Recommendations
The same recommendations as mentioned in biological resources impact A1 and A2 should be conducted to minimize the impact. Botanical surveys and wetland delineation should be conducted to determine what the best pipeline routes are that have the least detrimental effects.

Biological Resources Impact A5

The construction phase would not have conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Preliminary Statement of Impact Significance: Potentially No Impact

Constraint Discussion
Currently, there are no adopted habitat conservation plans within or adjacent to the Nipomo Mesa Project boundary. Therefore, the construction phase of the Nipomo Mesa Project will not have any impacts. However, there is a habitat conservation plan for the Oceano Dunes that is currently being drafted. If approved before the Nipomo Mesa Project undergoes the EIR process, an analysis of potential impacts will have to be conducted.

Recommendations
It is recommended that the status of the Oceano Dunes habitat conservation plan be monitored in case of approval. The HCP has a website containing all the documents related to the process (oceanoduneshcp.com).
The assessment of impacts due to operation of the desalination plant is based on the standards and mechanics of operation as discussed in the project description.

### Biological Resources Impact B1

The operational phase would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations or by the California Department of Fish and Game or US Fish and Wildlife Service.

**Preliminary Statement of Impact Significance:** Potentially No Impact

**Constraint Discussion**

The operational phase of the Nipomo Mesa Project, if best management practices are used, would not have a significant effect on the listed plant, terrestrial, and avian species and their habitat. However, as discussed in the Carlsbad Desalination Plant EIR, there is a potential for marine resources to be impacted by impingement and entrainment of plant intake systems, by increased salinity in effluent, and by any chemicals added to seawater throughout the operational phase.

**Recommendations**

It would be in the project manager’s best interest to use the survey recommendations previously mentioned to inform operation best practices. It is also recommended to invest in environmental monitoring services to ensure operation of the plant does not adversely affect marine resources.

### Biological Resources Impact B2

The operational phase would not have a substantial adverse effect on wetlands, riparian habitats, or other sensitive habitats identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service. This phase would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means.

**Preliminary Statement of Impact Significance:** Potentially No Impact

**Constraint Discussion**

The Nipomo Mesa Project’s operational phase would not have any significant impacts on the three habitats, ESHA, La Graciosa thistle critical habitat, and wetlands. Operations of the desalination plant will be localized to the SMF area therefore no habitats will be impacted. There will also be no direct impacts to riparian areas in the operational phase. In a worst possible scenario, leakage from pipes that carry feedwater into the desalination plant and highly concentrated brine out of the plant could percolate underground and cause damage to groundwater aquifers, which could affect riparian species if that were to occur.

**Recommendations**
**Biological Resources Impact B2**

It is recommended that the project manager makes infrastructure maintenance and inspection a priority during the operational phase to mitigate potential leakage of brine into the ground.

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**Biological Resources Impact B3**

The operational phase would not substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors.

**Preliminary Statement of Impact Significance:** Potentially Less than Significant

**Constraint Discussion**

The operational phase of the Nipomo Mesa Project would not have a significant effect on the listed migratory fish or wildlife species. Operations of the desalination plant will be localized to the SMF area and therefore will have no impacts on threatened and endangered plant species.

**Recommendations**

No mitigation measures are recommended because no impacts are anticipated.

---

**Biological Resources Impact B4**

The operational phase would not have any conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

**Preliminary Statement of Impact Significance:** Potentially No Impact

**Constraint Discussion**

The same ordinances, 23.07.170 (Environmentally Sensitive Habitats), 23.07.172 (Wetlands), 23.07.176 (Terrestrial Habitat Protection), and 23.07.178 (Marine Habitats), apply to the operational phase of the Nipomo Mesa Project. Although they are applicable, since the operational phase will be limited to the area the SMF is currently located at, there will be no conflicts with the ordinances.

**Recommendations**

No mitigation measures are recommended because no impacts are anticipated.

---

**Biological Resources Impact B5**

The operational phase would not have any conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

**Preliminary Statement of Impact Significance:** Potentially No Impact
Biological Resources Impact B5

Constraint Discussion
Currently, no habitat conservation plans have been adopted. Therefore, there are no impacts the operational phase of the Nipomo Mesa Project will have. If the Oceano Dunes HCP is approved in the future, impacts of the operational phase will have to be evaluated; impacts may not be significant as operations of the desalination plant will be limited to the current SMF area.

Recommendations
The same recommendations outlined in Biological Resources Impact A6 should be followed.

C. Conservation Phase
The assessment of impacts due to the conservation and environmental restoration phase of the Nipomo Mesa Project is based on current plans for restoration within the project site boundaries as discussed in the project description.

Biological Resources Impact C1

The restoration phase would not have adverse effects, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service.

Preliminary Statement of Impact Significance: Potentially No Impact

Constraint Discussion
The conservation phase of the Nipomo Mesa Project would not have any significant long term adverse effects on threatened and endangered plant, terrestrial, marine, or avian species present within the area. Instead, this phase will be beneficial to the listed species as conservation efforts will be focused on restoration of the dunes where many of the plant and terrestrial species occur. However, it should be noted that some of the short-term impacts of this phase will include the need for a number of regulatory permits, for the relocation of sensitive species, and for the education of construction workers on species and their habitats.

Recommendations
No mitigation measures are required because no impacts are anticipated. However, it is recommended that permit requirements for restoration are researched in preparation for this phase.
<table>
<thead>
<tr>
<th>Biological Resources Impact C2</th>
</tr>
</thead>
<tbody>
<tr>
<td>The restoration phase would not have a substantial adverse effect on the wetlands, riparian habitats, or other sensitive habitats identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service. This phase would not have any substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means.</td>
</tr>
<tr>
<td>Preliminary Statement of Impact Significance: Potentially No Impact</td>
</tr>
<tr>
<td>Constraint Discussion</td>
</tr>
<tr>
<td>The wetlands and riparian habitats located within the Nipomo Mesa Project boundary will not face adverse effects from the conservation phase. Rather, these sensitive communities will benefit from the restoration that will be conducted throughout the Nipomo Mesa Project boundary. The restoration phase will use vegetated waterways and filter strips to help convey runoff and improve water quality. Furthermore, this phase’s goal is to restore the natural communities within the Nipomo Mesa Project boundary and therefore, the present wetlands will benefit from the phase. It should be noted that permits will be required for wetland restoration.</td>
</tr>
<tr>
<td>Recommendations</td>
</tr>
<tr>
<td>No mitigation measures are recommended because no impacts are anticipated. As mentioned previously, permits will be required for this portion of the Nipomo Mesa Project.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biological Resources Impact C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>The restoration phase would not substantially Interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors.</td>
</tr>
<tr>
<td>Preliminary Statement of Impact Significance: Potentially No Impact</td>
</tr>
<tr>
<td>Constraint Discussion</td>
</tr>
<tr>
<td>No impacts are predicted to occur regarding migratory fish or wildlife species or regarding important wildlife corridors. The restoration phase would actually improve corridor connectivity and migratory habitats for fish and wildlife.</td>
</tr>
<tr>
<td>Recommendations</td>
</tr>
<tr>
<td>No mitigation measures are recommended because no impacts are anticipated.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biological Resources Impact C4</th>
</tr>
</thead>
<tbody>
<tr>
<td>The restoration phase would not have any conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.</td>
</tr>
<tr>
<td>Preliminary Statement of Impact Significance: Potentially No Impact</td>
</tr>
<tr>
<td>Constraint Discussion</td>
</tr>
</tbody>
</table>
Biological Resources Impact C4

The following ordinances are applicable to the restoration phase as they discuss areas involved in this component of the Nipomo Mesa Project: 23.07.170 (Environmentally Sensitive Habitats), 23.07.172 (Wetlands), 23.07.176 (Terrestrial Habitat Protection), and 23.07.178 (Marine Habitats). Although they are applicable, there are no conflicts with the ordinances and this part of the Nipomo Mesa Project. Instead, the restoration will promote the same goals the ordinances state by focusing on restoring the sand dune habitat and Little Oso Flaco Creek.

Recommendations

No mitigation measures are recommended because no impacts are anticipated.

Biological Resources Impact C5

The restoration phase would not have conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Preliminary Statement of Impact Significance: Potentially No Impact

Constraint Discussion

No Habitat Conservation Plan has been adopted within or adjacent to the Nipomo Mesa Project boundary. Thus, the restoration phase will not have any impacts. If in the future, the Oceano Dunes HCP is adopted, the restoration phase would impact the plan in a beneficial manner because it aims to assist the recovery of the sensitive habitats.

Recommendations

The same recommendations outlined in biological resources impact A6 should be followed.

Environmental Issue Area 2: Cultural Resources

Issue Area Description

Cultural resources are of vital importance when discussing the progress of potential projects throughout the US, in California specifically, there is a keen focus by CEQA and other local guidelines to ensure the historical and cultural significance of areas and artifacts are not harmed by development. These culturally impacted elements according to Public Resource Codes Section 21074(a)(1) and (2) under CEQA are “sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe” that are either included or determined to be eligible for inclusion in the California Register or included in a local register of historical resources, or a resource that is determined to be a tribal cultural resource by a lead agency, in its discretion and supported by substantial evidence.” Local and Federal policies, such as NEPA also have similar requirements that ensure that the status of historically significant sites or artifacts are not displaced or harmed.
Projects conducted require that there be reasonable cooperation with relevant local tribal groups for input and determination of the significance of the area regarding the historical aspect of the indigenous cultures, an action by which the group and other potential experts would give their determination of the site in relation to the historical importance of the area to the tribe and historically as a whole.

Figure 9. Indigenous Tribal Groups Historical Ranges
The central coast of California that the Nipomo Mesa Project site sits within is known to have been inhabited by indigenous people for at least the last ten thousand years from local archeological evidence. More specifically, the Chumash Tribe, who spread throughout what is today known as San Luis Obispo County. This tribe has an extensive history that continues into the modern day, represented by several tribal organizations. Furthermore, there is the colonial history associated with the region, the missions of California which have deep historical ties, as well as the persisting Spanish history present in San Luis Obispo County and the various local communities. Finally, the historical nature of California as a part of Mexico and the post Mexican-American War era (Carr, J.). These traditions and history are primarily maintained locally by SLO County. As well as enforced by Local, State, and Federal statutes that are designed to play a role in maintaining these historical realities with the goal of maintaining this history for the future and current generations to be better informed of the preceding people of the region.

Generally, as outlined by the California Regulatory Code § 15064.5, a site is deemed historically significant regarding cultural or archeological resources if it meets certain criteria:

A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
B. Is associated with the lives of persons important in our past;
C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
D. Has yielded, or may be likely to yield, information important in prehistory or history.

Features associated with the Chumash as well as artifacts related to the colonial era and beyond can all potentially be considered archeologically important part cultural resources under CEQA. They therefore would be considered pertinent to any investigation into the potential impacts of a proposed project. However, it is worth noting that while the entire region was at once considered either the territory of the Chumash, the Colonial Spanish, then Mexico, and finally the United States, that does not mean that every site will have significant impacts to the cultural heritage. Many site areas or development will not have relevant aspects that would be considered detrimental to the historical resources of the region.

The Nipomo Mesa Project site sits within an industrial land use zone near agricultural land as well as residential areas, which makes the site much less culturally sensitive as compared to others. However, there is always the potential for discovery of historically significant artifacts, due to the nature of the region being populated for the last ten thousand years, and even more so due to the specific history of several different cultures inhabiting the region and their interactions over the last several hundred years.
Potential Environmental Constraints and Recommendations

This section describes the impacts the Nipomo Mesa Project may have on the cultural resources within the Nipomo Mesa Project area. Impacts addressed include issues such as permanent and temporary effects on archeological and historical sites, features, places, cultural landscapes, sacred places, and objects. Impacts have been evaluated and estimated in comparison to the existing condition of the Nipomo Mesa Project site, as described in the Cultural Resources Existing Conditions section above. Thresholds of significance were applied to potential impacts to determine the predicted approximate significance of the impact. Quantitative and definite data on the potential impacts the Nipomo Mesa Project will have on cultural resources would need to be obtained through focused tribal surveys, historical community mapping performed by licensed professionals.

The predicted impacts are compiled in the tables below. Each table contains a brief impact statement, a preliminary statement of impact significance, a deeper discussion on the constraints regarding the impact, and recommendations for project managers accordingly.

Impact Prediction Methodology

In accordance with Appendix G of the CEQA Guidelines, and in conjunction with federal, state, and local regulations, the impacts to cultural resources would be considered significant if the Nipomo Mesa Project would:

- a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?
- b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?
- c) Disturb any human remains, including those interred outside of dedicated cemeteries?

This section is a discussion of the topic of Cultural Resource and the impacts that may result from the remediation, construction, operation, and conservation processes for the Nipomo Mesa Desalination Plant Project.
### Cultural Resources Impact A1

**Potential to cause a substantial adverse change in the significance of a historical resource. These terms are discussed above in the Cultural Resources Issue Area Description pursuant to regulatory code 15064.5**

**Preliminary Statement of Impact Significance:** Potentially Less than Significant

**Constraint Discussion**

The building and preparation of the site would not pose a significant impact to any known historical resources. The Nipomo Mesa Project site is not currently known to be within or encroaching on any historical sites or artifacts.

**Recommendations**

It is recommended to coordinate with local tribal and historical agencies. These will be requirements if it is determined that an EIR needs to be completed. Therefore, proactive cooperation with these groups will greatly benefit the Nipomo Mesa Project’s development and the process of involving further analysis of the Nipomo Mesa Project site.

### Cultural Resources Impact A2

**Potential to cause a substantial adverse change in the significance of an archaeological resources. These terms are discussed above in the Cultural Resources Issue Area Description pursuant to regulatory code 15064.5**

**Preliminary Statement of Impact Significance:** Potentially Less than Significant

**Constraint Discussion**

The Nipomo Mesa Project site and subsequent construction of the Desalination plant does not represent a current significant impact on local archaeological resources given the information available at this time.

**Recommendations**

It is recommended again that conferring with local tribal and historical agencies to reaffirm the stances held in this report, as well as to establish channels of communication, which will be a boon if there is to be changes to the status of the Nipomo Mesa Project site regarding cultural resources.
### Cultural Resources Impact A3

<table>
<thead>
<tr>
<th>Disturb any human remains, including those interred outside of dedicated cemeteries.</th>
</tr>
</thead>
</table>

### Preliminary Statement of Impact Significance: Potentially Less than Significant

### Constraint Discussion

The presence of human remains, either those in a historical burial site or those informally buried, is not a concern of the Nipomo Mesa Project site, and development on the site would not pose a significant impact during construction.

### Recommendations

It is highly recommended that avenues are explored in terms of reaching out to local tribal groups; specifically, the Chumash who have inhabited the area for the last ten thousand years, as well as other relevant historical agencies.

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### Environmental Issue Area 3: Geology and Soils

**Issue Area Description**

The Oceano Dunes are the largest dune ecosystem in the United States. The geology and soils of the dunes are unique and formed from various geomorphological processes. Due to the rarity of the Oceano Dunes, preserving and protecting its soils and geologies is of the utmost importance. The Nipomo Mesa Project site is in the Nipomo Mesa Region and at the proposed rehabilitation site there are two main sections which each have differing rehabilitation and impact analysis needs. Specifically, at the Phillips 66 Refinery site, the soils and geology have experienced hazardous waste pollution and industrial inputs due to refinery operations. The remaining open space has impacts from low impact grazing and other natural processes. With the rehabilitation and the construction of a desalination plant, there are multiple factors to consider when assessing the Nipomo Mesa Project’s impacts on soil and geology. This includes soil contamination from hazardous waste, damage and removal to due refinery activities, changes in salinity levels due to desalination development, soil removal due to deconstruction and development, and overall changes in historical geologic resources due to changes in land use.

**Project Site Soils**

The current conditions of the Phillips 66 Site reflect its 60 years of use as an oil refinery. The site topography is relatively flat, with 0-5 percent slopes with loamy sand to sandy soils with high salinity levels. The refinery sits close to Oso Flacos lake, which is a sensitive resource area that has the potential to have excess hazardous material drained into it due to the sandy soil conditions. The sites soils are a mixture of underlying alluvial and marine deposits with no notable structure besides occasional lamellar characteristics. Due to the dune geomorphological characteristics, soil profile
development is minimum as sand is the primary texture in the area. This makes the soil very limited in its extent to handle shallow excavations, and road development without major soil reclamation. In addition, due to refinery sludge being produced, soil salinity is higher than normal, which has an impact on nearby agriculture through seawater intrusion and has increased pH. Due to the lack of soil data in the Nipomo Mesa Project area, it is difficult to determine the specific soil conditions for the refinery and preservation area. However, according to the USDA WebSoil survey, 90 percent of the Nipomo Mesa Project area is classified as dune sand. The Nipomo Mesa Project site does not lie on any active fault lines, and there is little impact to project development or surrounding resources due to seismic activity. However, if seismic activity occurs, there is high potential for liquefaction to occur due to the site’s sandy soil texture. Most of the soil on the Nipomo Mesa Project site has a high-rating for wind erodibility, due to its sandy texture and this has led to dust pollution in areas of vehicle traffic.

Specific Soils
This information has been provided by USDA NRCS and SSURGO database information for the San Luis Obispo Coastal Region. Refer to figure 9 for visual references of the soil distribution. (USDA, 2020)

**Camarillo sandy loam, 0 to 2 percent slopes, cool MAAT, MLRA 14**
This soil a cool, deep, and poorly drained resting on alluvial plains adjacent to drainage and waterways. Through weathering of sandstone and shale alluvial material, this soil is formed and has a sandy loam surface layer of about 12 inches. Up to 60 inches below this top layer, the underlying soil is pale brown, yellowish brown, and light yellowish brown silty clay loams, light yellowish brown fine sandy loam, or pale brown loamy fine sand. There is evidence of irregular reddish patterns scattered in the middle of this soils profile. The soil is moderately alkaline as it contains a mixture of soluble salts found in arid soils and calcareous due to the presence of calcium carbonate, calcite, or chalk throughout. Natural vegetation on this soil includes annual grasses, forbs, shrubs, and scattered hardwoods. In this area, most of this soil is cultivated or used for grazing as this soil is moderately suited for rangeland. The soils available water holding capacity, wind and water erodibility, and permeability is moderate. Soil deposition might be an issue during years of high rainfall due to sediment load from slope runoff in further upslope areas. This can be managed through quality vegetation inputs, although the effective limiting rooting depth changes from limited in the wet season to high in the drier times of year. This soil makes up about 0.4 acres in the Nipomo Mesa Project area.

**Dune Land - 134**
This soil is sand sized particles that have a high-rating for wind erodibility and shift with wind (Figure 12). This dune land makes up hilly area’s in and surrounding the Nipomo Mesa Project site and has little to no vegetation besides sagebrush and beach grass. Due to the large particle size, permeability is extremely high and surface runoff is slow, and soil stability is low. This makes up about 64 percent of the Nipomo Mesa Project site area.

**Oceano Sand, 0 to 9 percent slopes - 184**
This soil is deep, excessively drained, level to moderately sloping, old, stabilized sand dunes formed by wind deposition. Vegetation is scattered and includes sage brush, grasses, and hardwoods. Its
deep surface layer is excessively drained brown sand, and its underlying material is pink and stratified pale brown sand. This soil can also often have a sandy loam surface layer, making it more stable than pure dune sand. With rapid permeability, the available water capacity is low, and it has slow surface runoff with high wind erodibility. The effective rooting layer is found at about 60 inches or more. This soil is more stable, making it suitable for recreational use including range land, or urban development and agriculture. The soil is poorly suited for rangeland as dry texture supports low quality forage for range animals. Gully erosion is also a potential hazard due to channeling of runoff water during wet seasons, which can be managed by vegetation inputs. This soil makes up about 29.7 percent of the Nipomo Mesa Project site area.

**Oceano Sand, 9 to 30 percent slopes - 185**
This soil has similar characteristics to the Oceano 0 to 9 percent slopes, but it is moderately to highly sloping on sand dunes. Permeability is rapid and water capacity is low resulting in medium to low surface runoff. Water and wind erosion hazards are moderate to high as well. It has an effective rooting depth of 60 inches or more, which makes it poorly suited for rangeland because of poor quality forage availability and erosion hazards. It also has a sandy loam layer occasionally, and some sort of structure compared to dune land. This oceano sand makes up about 78.9 acres or 4.8 percent of the Nipomo Mesa Project site area.

**Xerothents, Escarpment – 223**
This soil is steep to moderately steep, relatively smooth, descending slopes and terrace ends. The characteristics of this soil vary within a short distance but are well stabilized with vegetative cover of annual grasses and shrubs. Typically, this soil is sandy to sandy loam textured varying from 20 to 40 inches deep. If the soil surface is bare, runoff will be rapid and therefore erosion risk is high. Grazing is more suitable in this region but should be managed due to erodibility levels.

**Psamments and Fluvents, Wet**
This soil is small very poorly drained basins of Dune land that are sands and loamy sands containing layers of organic material which have been wind- and water-deposited. These soils are waterlogged almost year-round and are poorly drained with free water within 10 to 20 inches of the soil surface. Soil vegetation is made up of water and salt tolerant grasses and forbs. This soil makes up about 13.1 acres or 0.8 percent of the Nipomo Mesa Project site area.
Figure 10. NRCS Soil classifications of Project Site (NRCS, 2021)
Geology

Site and Regional Geology
The Phillips 66 Refinery and project site is located at the southwestern tip of Nipomo Mesa in the Santa Maria Valley. Just west of the Nipomo Mesa Project site and Nipomo Mesa is the Pacific Ocean and Oceano Dunes State Park and north-northeast of project site lies Edna Hills and Newsom Ridge. To the south, the Casmilia and Solomon hills surround Nipomo mesa and to the southeast the San Rafael Mountains are located. Geology is complex in the Nipomo mesa region, as it is influenced by both the California Coast Ranges and transverse Ranges of Southern California. Rocks beneath the Santa Maria valley include both tertiary and quaternary rocks formed from a series of west trending folds (Figure 11). The dune sand deposits come from the late quaternary rocks wind depositions which is underneath late quaternary alluvium, Plio-Pleistocene Sediments, the Paso Robles Formation, and potentially Pliocene and Miocene age sedimentary rocks (USGS, 1950).

Topography
The Nipomo Mesa Project site is directly east of Oceano Dunes State Park and is located on dune sand and sandy soils primarily. Elevations range from 50 to 200 feet above sea level, with mainly gentle slopes where steep slopes have been leveled out with grading. There are internally draining basins present on the Nipomo Mesa Project site, which drain into Oso Flaco Creek or smaller gulley’s. The underlying sediments are relatively uniform across the site, which is reflected in the main soil texture being sandy loam that is poorly graded and drained. There are some areas with limited clay and silt, but primarily looser to medium dune sands are present.
Figure 11. NRCS Soil classifications of Project Site (NRCS, 2021)
Figure 12. Liquefaction potential of project site.
Seismicity and Faulting

Due to San Luis Obispo’s complex geologic characteristics and its seismic activity, there is a potential for earthquakes and strong ground shaking. The closest active fault zone to the Nipomo Mesa Project site is 17 miles away, as classified by the California Geological Survey in the Alquist-Priolo Special Studies Zone Act of 1972 (CGS, 2007). This act limits the potential for development along the surface of an active fault line, to reduce potential structural damage and injury. There are other active faults in the surrounding area including the Hosgri, Oceano, Wilmar Avenue, and Orcutt-Casmalia Faults which have the highest potential to cause strong ground movement at within the Nipomo Mesa Project site location. A seismic analysis was performed in 1990 for Refinery Site upgrades in which it was determined that the fault with the highest potential for shaking would occur on the Hosgri or Orcutt-Casmalia faults, which have a calculated magnitude of 6.9 and 7.2. Using the Upper-Level Event determination, there is a 10 percent chance that these faults will shake in the next 50 years. (Dames & Moore, 1990).

Liquefaction

San Luis Obispo County General Plan Safety Elements indicates that areas like the ocean dunes made up of locally shallow groundwater and sandy soils have moderate to high potential for liquefaction. Liquefaction is when loose, saturated, granular soils lose their strength as soil water pressure builds up during an earthquake. This occurring beneath buildings or structures can cause major damage. Liquefaction can be caused by seepage of water through open pore spaces and soils with high infiltration rates, boils and mud spouts forming, and quicksand (USGS, 2011). Lateral spreading may occur when liquefaction occurs below ground, can causes mass movement of soils down slopes or at the ground surface (Figure 12). The sand of the Nipomo Mesa Project site may relatively uniform in texture and content, but the sands are dense enough to prevent extreme liquefaction events due to seismic ground movement. (Dames & Moore, 1990).

Mineral Resources

Using the California Geological Survey, the Nipomo Mesa Project site’s mineral significance has been classified as MRZ-3. MRZ-3 area’s contains known or potential minerals of undetermined significance (CGS, 2011). The Nipomo Mesa Project site is not located in an Energy or Extractive Resource Area as determined by the County of San Luis Obispo (County of San Luis Obispo, 2010).
Figure 13. Dust resistance and erodibility levels of Project Site. The areas in red are rated high, areas in yellow are rated moderately.
Figure 14. Soil displacement hazard levels of the Nipomo Mesa Project site, all rated high.
Figure 15. Soil displacement hazard levels of the Nipomo Mesa Project site, all rated high.
Impact Prediction Methodology

Based on CEQA Appendix G Guidelines, project site preparation, implementation, and operation would result in potentially significant impacts related to geology and soils if the Nipomo Mesa Project would:

A. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
   i. Rupture of a known earthquake fault, as delineated on the most recent Alquist Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to California Geological Survey Special Publication 42.
   ii. Strong seismic ground shaking?
   iii. Seismic-related ground failure, including liquefaction?
   iv. Landslides?

B. Result in substantial soil erosion or the loss of topsoil?

C. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Nipomo Mesa Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

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

E. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

F. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Listed below are the potential environmental constraints of the Nipomo Mesa Project site for its preparation, operation, and conservation phase relating to geology and soil resources.
### Geology and Soil Resources Impact A1

The Nipomo Mesa Project site during its preparation could potentially expose people or structures to substantial adverse effects due to the high liquefaction potential of the Nipomo Mesa Project site.

**Preliminary Statement of Impact Significance:** Potentially significant impact of people or damage to structures due to the direct impacts of liquefaction if not mitigated to less than significant impact levels.

**Constraint Discussion**

Soil type, level and duration of ground motions, and depth to groundwater are factors impacting liquefaction potential. Low lying areas with substrate of poorly consolidated water saturated sediments including Holocene-age sediments and deposits of artificial fill are areas of most risk to liquefaction. Due to the shallow depth to roots and water table, and poorly consolidated soil structure, the Oceano Dunes are very susceptible to liquefaction. This causes the potential to significantly impact the Nipomo Mesa Project sites existing structures and lead to adverse effects on human life during the Nipomo Mesa Project site preparation. During site preparation, there is the possibility to replace sand dunes with artificial fill for parking and building development. This replacement of soil to shallow fill increases the potential for adverse significant impacts due to liquefaction as well. The potential for damage from seismic hazards is specific to this project site, and there is no additive effect to surrounding areas, meaning there is no cumulative impact on surrounding areas due to liquefaction.

**Recommendations**

Construction and project site preparation that are intended for human use are required to comply with California Building Standards (CBC). CBC requires all structures designed for use to undergo a seismic analysis which assigns it to an earthquake resistant category (A-F) and assess the potential for liquefaction impacts on the structure. This requires any building plans on the Nipomo Mesa Project site to be assess for seismic hazards and activity impacts in case seismic activity occurs.

### Geology and Soil Resources Impact A2

The Nipomo Mesa Project site during its preparation could be exposed to seismic activity causing substantial adverse effects on people or structures at the Nipomo Mesa Project site.

**Preliminary Statement of Impact Significance:** Potentially significant impact to project site’s structures and human occupants if not mitigated to lower impact level.

**Constraint Discussion**

The closest active fault zone to the Nipomo Mesa Project site, including the Hosgri, Oceano, Wilmar Avenue, and Orcutt-Casmilia Faults which have the highest potential to cause strong ground movement at the Nipomo Mesa Project site location. After a seismic analysis in 1990, there is a 10 percent chance of seismic ground shaking to occur within the next 50 years. The California Geological Survey’s Alquist-Priolo Special

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Studies Zone Act of 1972 limits potential for development along surface of active fault line, which our project site is about 0.03 miles away from. The potential for damage from seismic hazards is specific to this project site, and there is no additive effect to surrounding areas. This means there is no cumulative impact on surrounding areas due to seismic hazards occurring on the Nipomo Mesa Project site.

**Recommendations**

As stated before, the Nipomo Mesa Project site must be analyzed for seismic activity potential and hazards as required by CBC, which are intended to reduce the damage on structures and hazard to human life by seismic activity. A seismic analysis is highly recommended, to perform any development or phase of the Nipomo Mesa Project. To develop on the Nipomo Mesa Project site, this is required and will need to be conducted by seismic and structural engineers.

<table>
<thead>
<tr>
<th>Geology and Soil Resources Impact A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Nipomo Mesa Project site during its preparation phase has the potential to impact wetland soils within the Nipomo Mesa Project site location without proper mitigation measures.</td>
</tr>
</tbody>
</table>

**Preliminary Statement of Impact Significance**: Directly and Indirectly potentially significantly impact on wetland soils and resources.

**Constraint Discussion**

There is a small section of the Nipomo Mesa Project site that contains wetland soils. Due to the ecological importance of the wetland soils on the dune and brackish water ecosystem, preserving these soils is very important to overall ecosystem health. During project site preparation, the potential for soil damage and removal for fill replacement is likely, which could occur in wetland soil areas or adjacent to these areas. If improper drainage solutions are set up in these excavated areas, it also could lead to significant impacts on the soil.

**Recommendations**

By assessing the surrounding project area and identifying locations of these wetland soils, significant impacts from project site preparation can be mitigated on these soils. This includes not performing any excavation techniques and monitoring project site preparation phase pollution discharge into these wetland soils to prevent damage.

<table>
<thead>
<tr>
<th>Geology and Soil Resources Impact A4</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Nipomo Mesa Project site during its preparation phase does not have the potential to impact life or property due significantly indirectly or directly to expansive soil.</td>
</tr>
</tbody>
</table>
**Geology and Soil Resources Impact A4**

**Preliminary Statement of Impact Significance:** The Nipomo Mesa Project site does not contain any expansive soils, so potentially no impact can occur, and mitigation is not required.

**Constraint Discussion**

High percentages of sand and low content of 2:1 phyllosilicate clay particle within the soil profile indicate that the Nipomo Mesa Project site soils are not expansive and pose no risk to human life and structures during the Nipomo Mesa Project site preparation phase. The Nipomo Mesa Project site is not under soils as defined in CEQA appendix G’s as defined in Table 18-1-B of the Uniform Building Code.

**Recommendations**

No recommendations required.

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**Geology and Soil Resources Impact A5**

The Nipomo Mesa Project site preparation could potentially have a significant impact on completion and surrounding areas due to wind and soil erodibility levels.

**Preliminary Statement of Impact Significance:** The existing soil and water erosion at the Nipomo Mesa Project site may be impactful to the construction of the Desalination Project because it will lead to a loss in topsoil and soil erosion which can also result in dust pollution.

**Constraint Discussion**

The USDA NRCS Soil Web Survey data for the Nipomo Mesa Project site provides a soil erosion feasibility rating index. On the Dune land surrounding the Nipomo Mesa Project site, erosion by wind is 250 tons per acre per year. For Camarillo sandy loam regions, the erosion by wind impacts only 86 tons per acre per year of the soil type in the area. The winds impact 220 tons per acre per year of Oceano Sands with 0 to 9 percent slopes at the Nipomo Mesa Project site (NRCS, 2020). Oceano sand with 9 to 30 percent slopes will be impacted also by 220 tons per acre per year of erosion by wind, accounting for about 5% of the land use of the Phillips 66 site. Wet psamments and fluvent will be impacted by wind with erosion at 134 tons per acre per year. The last soil unit, xerorthents and escarpments are not impacted by wind erosion, and only account for less than 1% of the land use of Phillips 66 site (Figure 10). This wind erodibility could potentially result in significant impact on the Nipomo Mesa Project preparation phase due to dust pollution causing adverse health effects. Due to preparation activities, this wind soil erosion could potentially impact the Nipomo Mesa Project site and its constituents as well as indirectly impact surrounding areas with dust pollution.

**Recommendations**

Research has been conducted on the Nipomo Mesa Dunes region in soil erodibility and how to minimize impacts of wind erosion by the Desert Research Institute (Gillies and Etyemezian, 2013). The implementation of porous fences is effective in reducing sand
flux rates, as well as PM$_{10}$ concentration downwind of the porous fences. It is recommended that for the Nipomo Mesa Project site there be installation of porous fences in and around the area of the Nipomo Mesa. With additional placement of dust catchments like porous fences, it will resist the wind erosion of the Oceano Dunes. Areas of highest potential erosion based off soil type should also be identified as places to install porous fences or wind erodibility control technology.

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**Geoogy and Soil Resources Impact A6**

The Nipomo Mesa Project site preparation could potentially have a significant impact on completion and surrounding areas due to water erodibility potential.

**Preliminary Statement of Impact Significance:** The existing soil and water erosion at the Nipomo Mesa Project site may be impactful to the construction of the Desalination Project because it will lead to a loss in topsoil and soil erosion which can also result in dust pollution.

**Constraint Discussion**

There are multiple factors that are impacted by the erosion and are categorized by amount of erosion per soil type. These factors include K Factor, Rock Free, K Factor, Whole Soil, T Factor, Wind Erodibility Group, and the Wind Erodibility Index. The K factor for rock free has to do with the susceptibility of a soil to “sheet and rill” erosion brought on by water (USDA, 2020). Rock free implies the erodibility of earth material that is smaller than 2 millimeters in diameter. This factor is part of the six factors used to measure the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE). These measurements forecast the amount of soil lost through sheet and rill erosion in tons per acre per year. The soil type determined by percentage of sand, silt, and organic matter help determine these estimates. Saturated hydraulic conductivity (Ksat) also contributes to these measurement estimates. For K factor, values ranging from 0.02 to 0.69, and with other factors being equal, a higher value will indicate a more sheet and rill erodibility when eroded with water. Factor K is not applied nor reported for organic horizons of soil (USDA, 2020).

Given the current geological and soil settings, the environmental constraint that will come from the Desalination Project will not further contribute to a loss in topsoil, but rather it will be an ongoing issue that will need to be acknowledged in the preparation phase. Unless defined by the geotechnical engineers, there will be no need to lay a new foundation on top of existing dune land, sandy soils, etc., and will be built atop old foundations for the Phillips 66 Santa Maria Oil Refinery. However, this does not change that the topsoil will continue to erode from wind and water erosion that comes through the area.

**Recommendations**

Research has been conducted on the Nipomo Mesa Dunes region in soil erodibility and how to minimize impacts of wind erosion by the Desert Research Institute (Gillies and...
### Geology and Soil Resources Impact A6

Etyemezian, 2013). The implementation of porous fences is effective in reducing sand flux rates, as well as PM$_{10}$ concentration downwind of the porous fences. It is recommended that for the Nipomo Mesa Project site there be installation of porous fences in and around the area of the Nipomo Mesa. With additional placement of dust catchments like porous fences, it will resist the wind erosion of the Oceano Dunes.

Areas of highest potential erosion based off soil type should also be identified as places to install porous fences or wind erodibility control technology. If geotechnical engineers suggest the installation of a new foundation on top of new existing soils in the Nipomo Mesa Project site, this might increase erodibility levels.

### Geology and Soil Resources Impact A7

The Nipomo Mesa Project site preparation has the potential to slightly significantly impact soil salinity levels.

**Preliminary Statement of Impact Significance:** Soils in the Nipomo Mesa Project site area have the potential to be slightly impacted by low surface salinization due to project preparation activities.

**Constraint Discussion**

From the report of the up-to-date information provided by the NRCS Soil Web Survey, there is Low Surface Salinization risk in most of the Nipomo Mesa Project site, and there exists Surface Salination Risk in some pockets in the western portion of the Nipomo Mesa Project site, west of Highway-1. The report is included in the NRCS web soil survey analysis of the Nipomo Mesa Project site which includes a map that shows how impacted by soil salinity this parcel is. The portion of the Nipomo Mesa Project site that is located within the parcel Area of Interest (AOI), there is some low salinization risk, which, as written in the report, this indicates that the soil has one or more “features that are unfavorable for salinization” when considering potential changes in soil salinity (NRCS, 2020). Changes in soil salinity during project preparation could be tampering with water absorption in soil due to construction altering soil structure, or the pulling of groundwater for water use.

**Recommendations**

Soil salinity levels should be monitored and established in area’s determined by the NRCS Soil Web Survey guide (NRCS, 2020). These area’s must be regarding as not suitable for water pumping or changes in soil structure. Groundwater monitoring should also take place if it is being used for water supply during project site preparation to see if soil salinity levels increase due to seawater intrusion.
The Nipomo Mesa Project site preparation for waste disposal and treatment could pose significant impacts on the project site’s soil health.

**Preliminary Statement of Impact Significance:** The Nipomo Mesa Project sites waste disposal method does not have the potential to cause significant impacts because of the use case of the project site itself. However, the Nipomo Mesa Project site is very limited in its ability to handle waste treatment activities, making this a potentially significant impact if waste is treated the plant.

**Constraint Discussion**

The Nipomo Mesa Project will not entail any waste treatment through septic tanks or evaporation ponds, meaning it is not necessary for soil to undergo this use. This makes the wastewater treatment not a significant area of concern. However, due to the sandy soil texture of the Nipomo Mesa Project site, water can percolate very quickly. The Nipomo Mesa Project site has been classified as very limited in its ability to safely treat waste.

**Recommendations**

Mitigation measures must be identified if the Nipomo Mesa Project site development will include an on-site waste treatment area. These mitigation measures include the installation of a pool liner or contamination leak sensor within the soil profile.

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## B. Operation

**Geology and Soil Resources Impact B1**

The Nipomo Mesa Project site during its operation could potentially expose people or structures to substantial adverse effects due to the high liquefaction potential of the project site.

**Preliminary Statement of Impact Significance:** Liquefaction could potentially significantly impact the area by damaging structures or harming people due to the direct impacts of liquefaction if not mitigated to less than significant impact levels.

**Constraint Discussion**

Soil type, level and duration of ground motions, and depth to groundwater are factors impacting liquefaction potential. Low lying areas with substrate of poorly consolidated water saturated sediments including Holocene-age sediments and deposits of artificial fill are areas of most risk to liquefaction (Figure 11). Due to the shallow depth to roots and water table, and poorly consolidated soil structure, the Ocean Dunes are very susceptible to liquefaction. This causes the potential to significantly impact the Nipomo Student Work Product - For Informational Purposes Only
### Geology and Soil Resources Impact B1

Nipomo Mesa Project sites operation structures and lead to adverse effects on human life. During site operation, the potential for liquefaction still exists like in the site preparation but due to the presence of new structures, there is the risk of these structures being impacted by liquefaction. If the desalination plant undergoes seismic shaking as addressed in CEQA appendix G, it could be damaged which leads to a potential threat in water supply, operations, and desalination technology. The potential for damage from seismic hazards is specific to this project site, and there is no additive effect to surrounding areas, meaning there is no cumulative impact on surrounding areas due to liquefaction.

**Recommendations**

Construction and project site preparation that are intended for human use are required to comply with California Building Standards (CBC). CBC requires all structures designed for use to undergo a seismic analysis which assigns it to an earthquake resistant category (A-F) and assess the potential for liquefaction impacts on the structure. This requires any building plans on the Nipomo Mesa Project site to be assessed for seismic hazards and activity impacts, which will help reduce impacts and damage if seismic activity occurs.

### Geology and Soil Resources Impact B2

The Nipomo Mesa Project site during its preparation could be exposed to seismic activity causing substantial adverse effects on people or structures at the project site.

**Preliminary Statement of Impact Significance:** Seismic activity could significantly impact project site's structures and human occupants if not mitigated to lower impact level.

**Constraint Discussion**

The closest active fault zone to the Nipomo Mesa Project site, including the Hosgri, Oceano, Wilmar Avenue, and Orcutt-Casmilia Faults which have the highest potential to cause strong ground movement at the Nipomo Mesa Project site location. After a seismic analysis in 1990, there is a 10 percent chance of seismic ground shaking to occur within the next 50 years. The California Geological Survey's Alquist-Priolo Special Studies Zone Act of 1972 limits potential for development along surface of active fault line, which our project site is about 0.03 miles away from. During site operation, if seismic activity occurs, the potential damage could significantly impact site occupants and buildings. The potential for damage from seismic hazards is specific to this project site, and there is no additive effect to surrounding areas. This means there is no cumulative impact on surrounding areas due to seismic hazards occurring on the Nipomo Mesa Project site.
### Geology and Soil Resources Impact B2

**Recommendations**

As stated before, the site must be analyzed for seismic activity potential and hazards as required by CBC, which are intended to reduce the damage on structures and hazard to human life by seismic activity. A project site seismic analysis is highly suggested. To develop on the Nipomo Mesa Project site, this is required and will need to be conducted by seismic and structural engineers. In addition, local and state government regulations should be followed and the necessary permits for building must be present for site operation in such proximity to fault lines.

### Geology and Soil Resources Impact B3

The Nipomo Mesa Project site during its operation phase has the potential to impact wetland soils within the project site location without proper mitigation measures.

**Preliminary Statement of Impact Significance:** The Nipomo Mesa Project site operation has the potential to significantly impact wetland soil resources which impacts ecosystem and surrounding area’s soil health without proper mitigation.

**Constraint Discussion**

There is a small section of the Nipomo Mesa Project site that contains wetland soils. Due to the ecological importance of the wetland soils on the dune and brackish water ecosystem, preserving these soils is very important to overall ecosystem health. During project site operation, there is the potential for soil damage due to desalination activities leading to changes in wetland soil properties. Again, if improper drainage solutions are set up for desalination plant water, it also could lead to significant impacts on the soil.

**Recommendations**

By assessing the surrounding project area and identifying locations of these wetland soils, significant impacts from site operation can be mitigated on these soils. This includes addressing site drainage methods near the wetland soils, site pollutants in proximity to wetland soils, and the plant’s proximity to the soils as well.
## Geology and Soil Resources Impact B4

The Nipomo Mesa Project site during its operational phase does not have the potential to impact life or property due significantly indirectly or directly to expansive soil.

**Preliminary Statement of Impact Significance:** The Nipomo Mesa Project site does not contain any expansive soils, so potentially no impact could occur, and mitigation is not required.

### Constraint Discussion

High percentages of sand and low content of 2:1 phyllosilicate clay particle within the soil profile indicate that the Nipomo Mesa Project site soils are not expansive and pose no risk to human life and structures during the Nipomo Mesa Project site preparation phase. The Nipomo Mesa Project site is not under soils as defined in CEQA Appendix G’s as defined in Table 18-1-B of the Uniform Building Code.

### Recommendations

No recommendations required.

## Geology and Soil Resources Impact B5

The Nipomo Mesa Project site operational phase may directly or indirectly cause substantial adverse effects by rupture of a known fault line, depending on desalination method.

**Preliminary Statement of Impact Significance:** The existing soil and water erosion at the Nipomo Mesa Project site will be impactful to the construction of the Desalination Project because it will lead to a loss in topsoil and soil erosion which can also result in dust pollution.

### Constraint Discussion

If the Nipomo Mesa Project decided to use deep well injection for disposal of the briny discharge, the planned project would have the potential to rupture the local San Luis Range Fault Line.

### Recommendations

The Nipomo Mesa Project intends to use submerged discharge to dispose of briny discharge, thus, there is insignificant potential for loss, injury, or death through the rupture of a fault. No significant impact will occur to project site’s geology and soils with this method of brine disposal.
## Geology and Soil Resources Impact B6

The Nipomo Mesa Project site operation could potentially have a significant impact on completion and surrounding areas due to wind and soil erodibility levels.

### Preliminary Statement of Impact Significance

The existing soil and water erosion at the Nipomo Mesa Project site may be impactful to the construction of the Desalination Project because it will lead to a loss in topsoil and soil erosion which can also result in dust pollution.

### Constraint Discussion

The USDA NRCS Soil Web Survey Data for the Nipomo Mesa Project site provides a soil erosion feasibility rating index. On the Dune land surrounding the Nipomo Mesa Project site, erosion by wind is 250 tons per acre per year. For Camarillo sandy loam regions, the erosion by wind impacts only 86 tons per acre per year of the soil type in the area. The winds impact 220 tons per acre per year of Oceano Sands with 0 to 9 percent slopes at the Nipomo Mesa Project site (USDA, 2020). Oceano sand with 9 to 30 percent slopes will be impacted also by 220 tons per acre per year of erosion by wind, accounting for about 5% of the land use of the Phillips 66 site. Wet psammments and fluvenets will be impacted by wind with erosion at 134 tons per acre per year. The last soil unit, xerorthents and escarpments are not impacted by wind erosion, and only account for less than 1% of the land use of Phillips 66 site. Due to operation activities, this wind soil erosion could potentially impact the Nipomo Mesa Project site and its constituents as well as indirectly impact surrounding areas with dust pollution.

### Recommendations

Research has been conducted on the Nipomo Mesa Dunes region in soil erodibility and how to minimize impacts of wind erosion by the Desert Research Institute (Gillies and Etyemezian, 2013). The implementation of porous fences is effective in reducing sand flux rates, as well as PM$_{10}$ concentration downwind of the porous fences. It is recommended that for the Nipomo Mesa Project site there be installation of porous fences in and around the area of the Nipomo Mesa. With additional placement of dust catchments like porous fences, it will resist the wind erosion of the Oceano Dunes. Areas of highest potential erosion based off soil type should also be identified as places to install porous fences or wind erodibility control technology. During operation, these areas should be regularly checked to see if erosion has occurred, and monitoring of dust pollution is necessary.
**Geology and Soil Resources Impact B7**

The Nipomo Mesa Project site operation could potentially have a significant impact on completion and surrounding areas due to water erodibility potential.

**Preliminary Statement of Impact Significance:** The existing soil and water erosion at the Nipomo Mesa Project Site may be impactful to the construction of the Desalination Project because it will lead to a loss in topsoil and soil erosion which can also result in dust pollution.

**Constraint Discussion**

There are multiple factors that are impacted by the erosion and are categorized by amount of erosion per soil type. These factors include K Factor, Rock Free, K Factor, Whole Soil, T Factor, Wind Erodibility Group, and the Wind Erodibility Index. The K factor for rock free has to do with the susceptibility of a soil to “sheet and rill” erosion brought on by water (NRCS, 2021). Rock free implies the erodibility of earth material that is smaller than 2 millimeters in diameter. This factor is part of the six factors used to measure the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE). These measurements foresee the amount of soil lost through sheet and rill erosion in tons per acre per year. The soil type determined by percentage of sand, silt, and organic matter help determine these estimates. Saturated hydraulic conductivity (Ksat) also contributes to these measurement estimates. For K factor, values ranging from 0.02 to 0.69, and with other factors being equal, a higher value will indicate a more sheet and rill erodibility when eroded with water. Factor K is not applied nor reported for organic horizons of soil (NRCS, 2020). Given the current geological and soil settings, the environmental constraint that will come from the Desalination Project will not further contribute to a loss in topsoil, but rather it will be an ongoing issue that will need to be acknowledged in the operation phase. During operations the topsoil will continue to erode from wind and water erosion that comes through the area.

**Recommendations**

Research has been conducted on the Nipomo Mesa Dunes region in soil erodibility and how to minimize impacts of wind erosion by the Desert Research Institute (Gillies and Etyemezian, 2013). The implementation of porous fences is effective in reducing sand flux rates, as well as PM$_{10}$ concentration downwind of the porous fences. It is recommended that for the Nipomo Mesa Project site there be installation of porous fences in and around the area of the Nipomo Mesa. With additional placement of dust catchments like porous fences, it will resist the wind erosion of the Oceano Dunes. Areas of highest potential erosion based off soil type should also be identified as places to install porous fences or wind erodibility control technology. Unless defined by the geotechnical engineers, there will be no need to lay a new
Geology and Soil Resources Impact B7

Foundation on top of existing dune land, sandy soils, etc., and will be built atop old foundations for the Phillips 66 Santa Maria Oil Refinery.

Geology and Soil Resources Impact B8

The Nipomo Mesa Project site operation for waste disposal and treatment could pose significant impacts on the project sites soil health.

Preliminary Statement of Impact Significance: The Nipomo Mesa Project sites waste disposal method does not have the potential to cause significant impacts because of the use case of the project site itself. However, the project site is very limited in its ability to handle waste treatment activities, making this a potentially significant impact if waste is treated the plant.

Constraint Discussion

The Nipomo Mesa Project will not entail any waste treatment through septic tanks or evaporation ponds, meaning it is not necessary for soil to undergo this use. This makes the wastewater treatment not a significant area of concern. However, due to the sandy soil texture of the Nipomo Mesa Project site, water can percolate very quickly. The Nipomo Mesa Project site has been classified as very limited in its ability to safely treat waste.

Recommendations

Mitigation measures must be identified if the Nipomo Mesa Project site development will include on site waste treatment area. These mitigation measures include the installation of a pool liner or contamination leak sensor within the soil profile.

C. Conservation

Geology and Soil Resources Impact C1

The Nipomo Mesa Project site during conservation could potentially expose people or structures to substantial adverse effects due to the high liquefaction potential of the project site.
Geology and Soil Resources Impact C1

**Preliminary Statement of Impact Significance:** Conservation efforts could be significantly impacted by damage caused by liquefaction if not mitigated to a lower significance level.

**Constraint Discussion**

Soil type, level and duration of ground motions, and depth to groundwater are factors impacting liquefaction potential. Low lying areas with substrate of poorly consolidated water saturated sediments including Holocene-age sediments and deposits of artificial fill are areas of most risk to liquefaction. Due to the shallow depth to roots and water table, and poorly consolidated soil structure, the Ocean Dunes are very susceptible to liquefaction. This causes the potential to significantly impact the Nipomo Mesa Project sites conservation areas and lead to adverse effects on human life during conservation. There is the possibility for conservation areas to undergo liquefaction due to natural soil texture and water levels. The potential for damage from seismic hazards is specific to this project site, and there is no additive effect to surrounding areas, meaning there is no cumulative impact on surrounding areas due to liquefaction. The potential for damage from seismic hazards is specific to this project site, and there is no additive effect to surrounding areas. This means there is no cumulative impact on surrounding areas due to liquefaction occurring on the Nipomo Mesa Project site.

**Recommendations**

Areas of highest liquefaction potential within conservation area should be identified to manage soil texture and water levels closely to decrease possibility of liquefaction to lower significant impacts. This identification can be performed through a geological or seismic analysis of the Nipomo Mesa Project site, which is required for operation. Areas within the conservation site close to the plant that have the high potential for liquefaction should be monitored as well.

Geology and Soil Resources Impact C2

The Nipomo Mesa Project site during conservation could be exposed to seismic activity causing substantial adverse effects on people or structures at the project site.

**Preliminary Statement of Impact Significance:** Conservation efforts could be significantly impacted by damage caused by seismic hazards if not mitigated to a lower significance level.

**Constraint Discussion**
Geology and Soil Resources Impact C2

The closest active fault zone to the Nipomo Mesa Project site, including the Hosgri, Oceano, Wilmar Avenue, and Orcutt-Casmilia Faults which have the highest potential to cause strong ground movement at the Nipomo Mesa Project site location. After a seismic analysis in 1990, there is a 10 percent chance of seismic ground shaking to occur within the next 50 years. The California Geological Survey’s Alquist-Priolo Special Studies Zone Act of 1972 limits potential for development along surface of active fault line, which our project site is about 0.03 miles away from. During site conservation, if seismic activity occurs, the potential damage could significantly impact site occupants and buildings. The potential for damage from seismic hazards is specific to this project site, and there is no additive effect to surrounding areas. This means there is no cumulative impact on surrounding areas due to seismic hazards occurring on the Nipomo Mesa Project site.

Recommendations

As stated before, the Nipomo Mesa Project site must be analyzed for seismic activity potential and hazards as required by CBC, which are intended to reduce the damage on structures and hazard to human life by seismic activity. A project site seismic analysis is highly suggested. To develop on the Nipomo Mesa Project site, this is required and will need to be conducted by seismic and structural engineers. In addition, local and state government regulations should be followed and the necessary permits for building must be present for site operation in such proximity to fault lines. Conservation efforts should address areas of seismic hazard in relation to restoration and general ecosystem health as well.

Geology and Soil Resources Impact C3

The Nipomo Mesa Project site during its conservation phase has no potential to impact wetland soils within the project site location.

Preliminary Statement of Impact Significance: Potentially little to no impact on wetland soils will occur during the conservation phase of the Nipomo Mesa Project.

Constraint Discussion

No constraints identified with wetland soils during conservation phase.

Recommendations

No recommendations required.
### Geology and Soil Resources Impact C4

**Preliminary Statement of Impact Significance:** The Nipomo Mesa Project site does not contain any expansive soils, so potentially no impact could occur, and mitigation is not required.

**Constraint Discussion**

High percentages of sand and low content of 2:1 phyllosilicate clay particle within the soil profile indicate that the Nipomo Mesa Project site soils are not expansive and pose no risk to human life and structures during the Nipomo Mesa Project site preparation phase. The Nipomo Mesa Project site is not under soils as defined in CEQA Appendix G’s as defined in Table 18-1-B of the Uniform Building Code.

**Recommendations**

No recommendations required.

### Geology and Soil Resources Impact C5

**Preliminary Statement of Impact Significance:** The existing soil and water erosion at the Nipomo Mesa Project site may be impactful to the construction of the Desalination Project because it will lead to a loss in topsoil and soil erosion which can also result in dust pollution.

**Constraint Discussion**

The USDA NRCS Soil Web Survey Data for the Nipomo Mesa Project site provides a soil erosion feasibility rating index. On the Dune land surrounding the Nipomo Mesa Project site, erosion by wind is 250 tons per acre per year. For Camarillo sandy loam regions, the erosion by wind impacts only 86 tons per acre per year of the soil type in the area. The winds impact 220 tons per acre per year of Oceano Sands with 0 to 9...
### Geology and Soil Resources Impact C5

| percent slopes at the Nipomo Mesa Project site. Oceano sand with 9 to 30 percent slopes will be impacted also by 220 tons per acre per year of erosion by wind, accounting for about 5% of the land use of the Phillips 66 site. Wet psamments and fluvents will be impacted by wind with erosion at 134 tons per acre per year. The last soil unit, xerorthents and escarpments are not impacted by wind erosion, and only account for less than 1% of the land use of Phillips 66 site. During conservation, these areas could potentially lead to dust pollution or soil erosion that hinders conservation efforts. |

### Recommendations

Research has been conducted on the Nipomo Mesa Dunes region in soil erodibility and how to minimize impacts of wind erosion by the Desert Research Institute (Gillies and Etyemezian, 2013). The implementation of porous fences is effective in reducing sand flux rates, as well as PM$_{10}$ concentration downwind of the porous fences. It is recommended that for the Nipomo Mesa Project site there be installation of porous fences in and around the area of the Nipomo Mesa. With additional placement of dust catchments like porous fences, it will resist the wind erosion of the Oceano Dunes. Areas of highest potential erosion based off soil type should also be identified as places to install porous fences or wind erodibility control technology. During conservation, these areas should be regularly checked to see if erosion has occurred, and monitoring of dust pollution is necessary.

### Geology and Soil Resources Impact C6

| The Nipomo Mesa Project site conservation phase for waste disposal and treatment could pose significant impacts on the project sites soil health. |

**Preliminary Statement of Impact Significance:** The Nipomo Mesa Project sites waste disposal method does not have the potential to cause significant impacts because of the use case of the project site itself. However, the project site is very limited in its ability to handle waste treatment activities, making this a potentially significant impact if waste is treated the plant.

### Constraint Discussion

The Nipomo Mesa Project will not entail any waste treatment through septic tanks or evaporation ponds, meaning it is not necessary for soil to undergo this use. This makes the wastewater treatment not a significant area of concern. However, due to the sandy soil texture of the Nipomo Mesa Project site, water can percolate very quickly.
## Geology and Soil Resources Impact C6

The Nipomo Mesa Project site has been classified as very limited in its ability to safely treat waste. In the designated conservation areas, this poses no concern.

**Recommendations**

Mitigation measures must be identified if the Nipomo Mesa Project site development will include on site waste treatment area. These mitigation measures include the installation of a pool liner or contamination leak sensor within the soil profile. In the designated conservation areas, this poses no concern.

## Geology and Soil Resources Impact C7

*The Nipomo Mesa Project site operational phase will not directly or indirectly cause substantial adverse effects by rupture of a known fault line, depending on desalination method.*

**Preliminary Statement of Impact Significance:** Potentially no significant impacts will occur due to project conservation regarding rupturing a fault line.

**Constraint Discussion**

No constraints.

**Recommendations**

No recommendations.

## Geology and Soil Resources Impact C8

*The Nipomo Mesa Project site conservation has no potential to have a significant impact on completion and surrounding areas due to water erodibility potential.*

**Preliminary Statement of Impact Significance:** No potential to negatively impact and increase water erodibility levels.

**Constraint Discussion**

No constraints.

**Recommendations**

No recommendations.
Summary
As stated, the lack of soil development has created shallow sandy soils in the Nipomo Mesa Project site area. When rehabilitation occurs, the soil and geologic resources must be managed carefully to ensure that excavation activities and hazardous material cleanup does not cause greater instability. Construction on site must be mindful of wind erosion that can increase with greater traffic, and this must be kept to a minimum to prevent dust pollution onto the surrounding community, agricultural, and sensitive resource areas. Before performing any rehabilitation and excavation for the Nipomo Mesa Project, more soil and geotechnical studies must occur to ensure all impacts have been identified. The high potential for liquefaction and seismic activity must be addressed to meet development criteria and permitting standards. Due to the proximity to a sensitive resource area, the high drainage capability of the soil must be considered to prevent material runoff from flowing into the resource areas. Due to the complexity of the geologic resources on site and in the surrounding area, the Nipomo Mesa Project must take into consideration all impacts relating to changing geologic resources in correlation with the Paso Robles Formation and surrounding groundwater aquifers. The Nipomo Mesa Project will limit impacts on soil health and contamination, as the Nipomo Mesa Projects changes in land use reflect a change to a lower potential of contamination activity, but still this must be considered when performing restoration. The potential for significant damage to cultural geologic resources such as the dunes also must be considered when redeveloping, as the dunes serve to provide both economic and educational opportunities to the surrounding communities.

Environmental Issue Area 4: Recreation

Issue Area Description

This section includes a detailed description of the baseline environmental conditions relevant to recreational resources, on and near the Nipomo Mesa Project site. Information for this section is based primarily on the Phillips 66 Company Rail Spur Extension and Crude Unloading Project Public Draft EIR.

On-Site Recreational Use
The 1,780-acre project site does not currently contain parks or recreational facilities. Around 200 acres, or roughly 11 percent of the land, currently supports the heavy industrial uses associated with the Santa Maria Refinery (SMR). The SMR contains a crude oil and carbon processing facility, associated storage tanks, pipelines, offices, parking and other relevant structures. Other areas of the Nipomo Mesa Project site are undeveloped and held as open
space or used as a preservation area for wildlife in the Nipomo Dunes. These areas support coastal scrub and native and non-native grasses. The remaining areas are grazed by cattle.

**Surrounding Recreational Resources**

Recreational resources in the Nipomo Mesa Project vicinity include (Figure 15):

**Juan Bautista de Anza National Historic Trail**
The Juan Bautista de Anza National Historic Trail corridor passes through the Nipomo Mesa Project site. The historic corridor does not relate to any physical recreational facility that has been developed on the ground. Instead, it is a general path believed to have been traveled by the 1776 Anza expedition; the first colonizing expedition from New Spain to come overland into California. It connects a variety of historic sites related to the Spanish Colonial. A recreational segment of the Anza Trail has been developed along State Route 1 east of the Nipomo Mesa Project site.

**Oceano Dunes State Vehicle Recreation Area**

Oceano Dunes State Vehicle Recreation Area (SVRA) is a geologically unique sand dune complex that provides over 2,500 acres for public off-highway vehicle (OHV) use. The SVRA is located approximately 1 mile west of the western boundary of the Nipomo Mesa Project site. One of several OHV areas administered by the California Department of Parks and Recreation, Oceano Dunes SVRA also offers visitors other recreational activities such as swimming, surfing, fishing, camping, and hiking. The Oceano Dunes SVRA accommodates around 2 million visitors per year (California State Parks, 2020).

**Oso Flaco Lake Natural Area**

Oso Flaco Lake Natural Area is a public State Park that is part of the Oceano Dunes State Vehicle Recreation Area. It is located approximately 1.75 miles southwest of the Nipomo Mesa Project site. The park offers visitors a trip through several diverse natural habitats to view flora and fauna and grants access to a remote sandy beach.

**Guadalupe-Nipomo Dunes National Wildlife Refuge**
The Guadalupe-Nipomo Dunes National Wildlife Refuge was established in 2000 to protect breeding habitats for various threatened and endangered species. The Refuge is located within the Guadalupe-Nipomo Dunes Preserve, along an 18-mile stretch of coastline. Visitors...
enter the Refuge from either the Rancho Guadalupe Dunes County Park to the south or the Oso Flaco Lake Natural Area to the north. The Refuge is located approximately 2 miles southwest of the Nipomo Mesa Project site and offers numerous recreational opportunities including hiking, wildlife viewing, and fishing.

**Monarch Dunes Butterfly Habitat**

Located east of the Nipomo Mesa Project boundary, the Monarch Dunes Butterfly Habitat in Nipomo is a nineteen-acre rectangular grove of Tasmanian blue gum eucalyptus trees that encompasses two wind buffer zones on the western and southern borders of the habitat. The site offers residents and visitors walkways and picnic areas.

**Cypress Ridge Golf Course**

Located northeast of the Nipomo Mesa Project site in Arroyo Grande, Cypress Ridge is an award-winning Peter Jacobsen Signature Golf Course. Facilities include: a two-tier grass tee driving range, practice putting green, full-service pro shop, bar and grill, and banquet accommodations.

**Black Lake Golf Resort**

Located to the east of the Nipomo Mesa Project site on the Nipomo Mesa, Black Lake Golf Resort features 27 holes comprising three distinct nine-hole layouts. The resort also features a bar and grill, banquet facilities, and concert accommodations.

**Monarch Dunes Golf Course**

Monarch Dunes opened to the public for play on January 1, 2006 and is the first 18-hole golf course constructed within Woodlands Village, the largest master-planned community in California’s Central Coast. Located east of the Nipomo Mesa Project site in Nipomo, the course is known for its windswept dunes, coastal vistas and amber-colored hillsides. The course also features a driving range, practice putting green, pro shop, bar and grill, and banquet accommodations.
Figure 16. Recreational areas around the Nipomo Mesa Project site
Nipomo Mesa Project

Future Recreation Plans

In their December 2020 Public Works Plan, California State parks proposed development of the Nipomo Mesa Project site for recreation. Their plans include a day-use parking and staging area, camping areas, facilities for educational programs, OHV safety training, concessions, special events, visitor engagement, and additional OHV and non-motorized recreation (California State Parks, 2020). All these proposed developments are contingent upon State Parks acquiring rights to the Nipomo Mesa Project site through future title, lease, or easements to the property. The California Coastal Commission released a staff report that largely opposes State Parks' plans. Instead, the Coastal Commission wants State Parks to eliminate off-highway vehicle (OHV) use over a five-year transition period; provide low-cost vehicular access and camping on the beach between West Grand and Pier avenues in Oceano; close the Pier Avenue entrance to vehicles and make changes to protect natural resources in the park (California Coastal Commission, 2021).

Figure 17. Map of proposed State Park recreational developments on the Nipomo Mesa Project site (California State Parks, 2020).
Potential Environmental Constraints and Recommendations

Based on CEQA Appendix G Guidelines, project site construction, operation, and conservation will result in potentially significant impacts related to recreational resources if the Nipomo Mesa Project increases the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility will occur or be accelerated. It will also result in significant impacts if the Nipomo Mesa Project includes recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

This section is an evaluation of potential environmental constraints on recreational resources and the impacts that may result from the construction, operation, and conservation processes for the Nipomo Mesa Desalination Plant Project.

A. Project Site Preparation/Construction

<table>
<thead>
<tr>
<th>Recreation Impact A1</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Nipomo Mesa Project site during construction could temporarily increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.</td>
</tr>
</tbody>
</table>

Preliminary Statement of Impact Significance: Project preparation could potentially significantly impact the use of other recreational facilities during the construction phase.

Constraint Discussion

This analysis assumes that an offshore intake pipeline would be installed along with an onshore pumping station located at the plant facility. Although more information is needed regarding construction techniques, it is possible that the construction of the intake pipeline would run through nearby recreational areas. The Oceano Dunes State Vehicle Recreation Area is located west of the Nipomo Mesa Project site. Construction of an intake pipeline could potentially impact that area. The Oceano Dunes SVRA accommodates around 2 million visitors per year. If the SVRA were to close for construction, those visitors might choose other areas to recreate, or other areas to take their vehicles off road. Other local recreational areas might be temporarily impacted by an influx of visitors.

Recommendations
Recreation Impact A1

Again, more information is needed regarding construction techniques for the intake pipeline. If the pipeline will run through the SVRA, keeping the area open to visitors during construction, in some capacity, could reduce the stress on other local recreational areas. Furthermore, scheduling construction of the intake pipeline for months when the Oceano Dunes SVRA typically receives less visitors could reduce recreational impacts. Seasonally, visitation increases during the summer months (late May to early September) and is lower during the fall, winter, and spring, other than holiday weekends (California State Parks, 2020).

B. Operation

Recreation Impact B1

The Nipomo Mesa Project site during operation does not have the potential to increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

Preliminary Statement of Impact Significance: Potentially Less than Significant

Constraint Discussion

The intake pipeline discussed in the construction phase should be a short-term impact, only affecting the construction phase. It will most likely be buried under ground once the desalination plant is operational. The desalination plant will repurpose the SMR. Therefore, there should not be a substantial increase in the number of residents and jobs in the city. As a result, the demand for parks and other recreational facilities should remain stable.

Recommendations

No recommendations are required.
C. Conservation

Recreation Impact C1

The Nipomo Mesa Project site conservation does not have the potential to increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

Preliminary Statement of Impact Significance: Potentially Less than Significant

Constraint Discussion

The 1,780-acre project site does not currently contain parks or recreational facilities. The site contains the SMR, open space, preserved wildlife, and grazing areas for cattle. The area is not currently used for recreation. Therefore, conservation of the land should not increase the use of existing neighborhood and regional parks or other recreational facilities.

Recommendations

No recommendations are required.

Summary

Desalination plant operation and site restoration should not create any long-term impacts to recreational resources. However, the Nipomo Mesa Project as proposed does not contain plans for the development of recreational facilities. This aligns with the wishes of the Coastal Commission instead of State Parks. This has the potential to upset residents who might feel that the land should be opened for recreation. There is currently controversy over land use practices at the Oceano Dunes State Vehicle Recreation Area. Many members of the community are divided into those who want to protect sensitive wildlife in the area and those who want to preserve the recreational and economic value of the SVRA (California Coastal Commission, 2021). Similar conflict could arise with this project. Further research should be done to gauge public sentiment towards restoring the land for conservation purposes as opposed to recreation. Common ways of measuring public opinion include face-to-face interviews as well as telephone and mail surveys.

Environmental Processes and Permits
This section details the land use permits the Nipomo Mesa Project is required to have to develop within San Luis Obispo County. The Nipomo Mesa Project is subject to Title 23 (Coastal Zone Land Use) of the San Luis Obispo County Code because of its location within the coastal zone. The section applicable to the Nipomo Mesa Project within Title 23 were determined by using the Costal Table “O” from the San Luis Obispo County Coastal Allowable Use Tables and Definitions pdf. The Industrial land use category was used as well as the Public Utilities Facilities under the Transportation Use Group (J) to determine the pertinent land use ordinance section. The Public Utilities Facilities description was the most appropriate for the Nipomo Mesa Project therefore it was selected to be used for Table “O”. Nevertheless, a meeting with the County of San Luis Obispo is highly recommended to review which local permits are pertinent to Nipomo Mesa Project. The following paragraphs briefly describe the sections of Title 23 applicable to the Nipomo Mesa Project as determined by Table “O”.

Under Title 23, the Public Utility Facilities section (23.08.288) is the applicable part of the County Code to the Nipomo Mesa Project. The section details the requirements for the permit, application contents, development standards, and limitations. Section 23.08.286 is also applicable and standards for pipelines, communications transmission lines, and related facilities. In addition, Development Plan approval, section 23.020.34, is needed since the Nipomo Mesa Project is not an electric and communications transmission or natural gas regulation and distribution. The purpose of the Development Plan approval is to allow the public to review the Nipomo Mesa Project proposal as well as to assure that it is appropriate for the community. The process begins with an environmental determination which is required by CEQA. Once completed, a staff report is written which recommends if the Nipomo Mesa Project “should be approved, conditionally approved, or disapproved” (San Luis Obispo County Code, n.d.). A public hearing is held and then the application moves on to the Subdivision Review Board or Planning Commission for the final approval or disapproval.

**CEQA Process and Approach**

CEQA is a governmental process that requires any proposed project’s environmental impact to be assessed by a lead agency. To be compliant with CEQA, a proposed project will have to complete an Initial Study which will lead to a Negative Declaration (ND), Mitigated Negative Declaration (MND) or Environmental Impact Report (EIR). The Nipomo Mesa Project will most likely require an EIR to be compliant with CEQA. An EIR will include evaluations of ways to mitigate the potential environmental effects of a given project. CEQA is an extended process with the goal of effectively evaluating the baselines of the Nipomo Mesa Project site in regard to the related issue areas. This section is an assessment and layout of this process as well as the expected process the Nipomo Mesa Project may go through.
Figure 18. Flowchart of the CEQA process the Nipomo Mesa Project will undergo.
Phase 1 – EIR Initiation

CEQA is initiated after the Nipomo Mesa Project has been put under review for the Title 23 land use and development permit in SLO County. An initial study must be performed of the Nipomo Mesa Project site to determine environmental constraints and current site conditions.

4.1.1 Kickoff meeting and Data Collection

After the initial study and notice of preparation have been published, a kickoff meeting is held to review the lead agency’s objectives, confirm development methodologies, and details of DUNES processes and tasks. Goals will be established for the Nipomo Mesa Project’s initial preparation phase. All of this is required to gather the necessary data and documents to move the Nipomo Mesa Project into its operation and conservation phase while following SLO county guidelines. This data will be provided through independent contractors performing site analysis, Dunes Environmental data analysis, and local resources.

4.1.2 Scoping and Agency Consultation

In response to the Nipomo Mesa Project notice of preparation and its initial study, the responsible will begin to determine contents required to complete an EIR which meets Lead Agency requirements. If requested, the Nipomo Mesa Project application and other invested trustees, a notice of meeting will be provided to all involved parties as required in CEQA guidelines § 15082c. This meeting will involve the determination of project and EIR scope to meet guidelines and other requirements by the lead agency, trustee agency, and project applicants. This meeting also is the time for interested agency like DUNES and the public to submit comments about the Nipomo Mesa Project’s scope and components.

Phase 2 - EIR preparation

4.2.1 Admin Draft EIR

To create a legally sound draft EIR for the Nipomo Mesa Project, the lead agency must follow CEQA guidelines. This environmental impact analysis will contain a table of contents, project description, environmental setting and existing conditions, significance thresholds, impact statements, mitigation measures and alternatives, non-significant impacts, and a list of references. This draft will reflect the lead agency’s judgment of the lead agency and scoping meetings judgements regarding the Nipomo Mesa Project. Once this draft is completed, it will be delivered to the lead agency for internal review by all the necessary involved departments. If more revision is required, the responsible agency will revise where necessary to meet requirements.

4.2.2

Upon completion of the draft EIR the Lead Agency will then submit the draft for public review and hearings along with Notice of Availability. The Notice of Availability acts to announce the mandatory 45-day public review period of this version of the Environmental Impact
Nipomo Mesa Project Report. This allows for an opportunity for the public to comment, analyze, and draw conclusions that are then submitted for consideration in the next phases of the EIR process. A round of commenting will be held within SLO County, during which comments and potential adjustments will be recorded, collected, and compiled for further review and possible implementation.

4.3 Phase 3-EIR Finalization
At this stage of the process, the county will provide copies of all letters received from public review. The project manager will review all comments. The project team will then respond to applicable comments and make any necessary changes to the EIR. The deliverables for the administrative final EIR include five copies that are 3-hole drilled as well as a USB Flash Drive.

4.3.2 Final EIR and Lead Agency Hearings
Upon review of the Administrative Final EIR, the project lead will be informed of any changes that need to be made for the Final EIR. At this point it is expected that only minor changes will be needed for the Final EIR. The project lead will have a meeting with their team to complete all the necessary revisions to the EIR as preparation for submission. The project manager will then confirm all of these revisions with the Lead Agency and start the process for submittal of the Final EIR. The deliverables for the Final EIR will include five copies in three ring binders, 25 bound copies, and 25 USB Flash Drives with the complete searchable report.

4.3.3 Decision Documentation
SLO County, the Lead Agency, will provide a sample of the CEQA findings, and the consulting agency will create a draft of the CEQA findings. These CEQA findings, which would be consistent with the regulations and statutes of CEQA, for each potentially significant impact would garner one of the following results:

- Mitigation is accounted for by the changes in the Nipomo Mesa Project, or mitigation measures are required for approval.
- The mitigations are the responsibility of another entity.
- Mitigation is not feasible.

If mitigation is not feasible then the findings will provide reasoning for the overriding concern that makes the significant impacts acceptable. Statements in the findings will be referenced to the EIR contents or external evidence will be provided and referenced.

Regulatory Permit Analysis
This section discusses the permits, approvals, and regulatory requirements that would be necessary to obtain before the Nipomo Mesa Project can begin development. The permit process consists of a number of steps and actions that involve inter-agency collaboration between the applicant (ERI), public/private organizations, and Federal, state, and/or local
Nipomo Mesa Project will likely be subject to various regulations and could require discretionary permits from such entities.

The following table summarizes the permits and authorizations that will likely be required to begin development of the Nipomo Mesa Project, followed by a detailed discussion of each permit or approval and the general time that it is expected to take to obtain them. It should be noted that this section only discusses those permits or approvals that relate to the biological resources and hydrological resources of the Nipomo Mesa Project. It is recommended that the project applicant examines the permits and approvals needed for other areas of the Nipomo Mesa Project (i.e., geological resources, cultural resources) before beginning project development.

Table 5. List of federal and state permits needed for the Nipomo Mesa Project

<table>
<thead>
<tr>
<th>Regulatory Agency</th>
<th>Underlying Statute or Regulation</th>
<th>Permit/Approval</th>
<th>Regulated Activity</th>
<th>Other Related Approvals</th>
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<tbody>
<tr>
<td><strong>Federal Agencies</strong></td>
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<tr>
<td>U.S. Army Corps of Engineers</td>
<td>Rivers and Harbors Act 33 U.S.C. §§ 400 – 467 (1899)</td>
<td>Section 10 Permit</td>
<td>Construction, excavation, or deposition of materials in, over, or under such waters, or any work which would affect the course of those waters.</td>
<td>NEPA compliance</td>
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</tbody>
</table>

Student Work Product - For Informational Purposes Only
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<thead>
<tr>
<th>Regulatory Agency</th>
<th>Underlying Statute or Regulation</th>
<th>Permit/Approval</th>
<th>Regulated Activity</th>
<th>Other Related Approvals</th>
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<tbody>
<tr>
<td>U.S. Army Corps of Engineers</td>
<td>Clean Water Act 33 U.S.C. §1251 et seq. (1972)</td>
<td>Section 404 Individual Permit or Nationwide Permit</td>
<td>Any point source discharge of dredged or fill material into Waters of the US. Including bank stabilization and grading in the Waters of the US. Both temporary and permanent impacts.</td>
<td>· NEPA compliance · Compliance with the National Historic Preservation Act (NHPA) Consultation under Section 106 through the SHPO. · California Coastal Commission Letter of Concurrence with the CA Coastal Act. · RWQCB Section 401 Water Quality Certification; requires CEQA compliance (see below)</td>
</tr>
<tr>
<td>U.S. Fish and Wildlife Service</td>
<td>Endangered Species Act 16 U.S.C. § 1531 et seq. (1973)</td>
<td>Section 7 Consultation - and/or - Section 10 Incidental Permit - and/or – Safe Harbor Agreement</td>
<td>Potential impacts to federally-listed species, species proposed for listing, and/or designated Critical Habitat of such species.</td>
<td>Biological Opinion (Section 7) Habitat Conservation Plan (Section 10)</td>
</tr>
<tr>
<td>NOAA Fisheries</td>
<td>Endangered Species Act 16 U.S.C. § 1531 et seq. (1973)</td>
<td>Section 7 Consultation - and/or - Section 10 Incidental Permit - and/or – Safe Harbor Agreement</td>
<td>Potential impacts to federally-listed marine and anadromous species, species proposed for listing, and/or designated Critical Habitat of such species.</td>
<td>Biological Opinion (Section 7) Habitat Conservation Plan (Section 10)</td>
</tr>
<tr>
<td>Regulatory Agency</td>
<td>Underlying Statute or Regulation</td>
<td>Permit/Approval</td>
<td>Regulated Activity</td>
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<tr>
<td>Central Coast Regional Water Quality Control Board</td>
<td>Clean Water Act 33 U.S.C. §1251 et seq. (1972)</td>
<td>Section 401 Water Quality Certification</td>
<td>Required for actions that trigger a Clean Water Act Section 404 permit (see above) to certify that a discharge will not violate state water quality standards. Applies to Waters of the US.</td>
<td>CEQA compliance</td>
</tr>
<tr>
<td>Central Coast Regional Water Quality Control Board</td>
<td>Clean Water Act 33 U.S.C. §1251 et seq. (1972)</td>
<td>National Pollution Discharge Elimination System Permit</td>
<td>Point sources that discharge pollutants into Waters of the US. Point sources are discrete conveyances such as pipes or man-made ditches. Examples of pollutants include, but are not limited to, rock, sand, dirt, and agricultural, industrial, and municipal waste.</td>
<td>NEPA and CEQA compliance</td>
</tr>
<tr>
<td>Regulatory Agency</td>
<td>Underlying Statute or Regulation</td>
<td>Permit/Approval</td>
<td>Regulated Activity</td>
<td>Other Related Approvals</td>
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<tr>
<td><strong>Central Coast Regional Water Quality Control Board</strong></td>
<td>Porter-Cologne Water Quality Control Act (CA Water Code Section 7)</td>
<td>Waste Discharge Requirement</td>
<td>Activities, discharges, or proposed activities or discharges that could affect California's surface, coastal, or ground waters.</td>
<td>CEQA compliance</td>
</tr>
<tr>
<td><strong>Central Coast Regional Water Quality Control Board</strong></td>
<td>Construction General Permit Order 2009-0009-DWQ</td>
<td>Construction General Permit</td>
<td>Dischargers whose projects disturb one (1) or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres.</td>
<td>Development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer (QSD).</td>
</tr>
<tr>
<td><strong>California State Lands Commission</strong></td>
<td>CA Code of Regulations Chapter 1 (State Lands Commission), Division 3 (State Property Operations), Title 2 (Administration)</td>
<td>Lease agreement</td>
<td>Portions of the Nipomo Mesa Project located within Public Trust lands (the beds of tidal and navigable waters acquired at statehood in 1850)</td>
<td>CEQA compliance</td>
</tr>
<tr>
<td>Regulatory Agency</td>
<td>Underlying Statute or Regulation</td>
<td>Permit/Approval</td>
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<tr>
<td>California Coastal Commission</td>
<td>California Coastal Act (PRC Division 20)</td>
<td>Coastal Development Permit Appeal Authority</td>
<td>Activities that affect land or water uses or natural resources of the coastal zone must be reviewed for consistency with the California Coastal Management Plan (CCMP).</td>
<td>CEQA compliance</td>
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<td></td>
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<td>Letter of concurrence with CWA Section 404 permit.</td>
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<tr>
<td>California Department of Fish and Wildlife</td>
<td>Section 1602 of the California Fish and Game Code</td>
<td>Lake and Streambed Alteration Agreement</td>
<td>Initiation of any construction project that will: 1) substantially divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; 2) use materials from a streambed; or 3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake.</td>
<td>CEQA compliance</td>
</tr>
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<td>Regulatory Agency</td>
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<td>Permit/Approval</td>
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<tr>
<td>California Department of Fish and Wildlife</td>
<td>California Endangered Species Act (California Fish and Game Code Division 3, Chapter 1.5)</td>
<td>Section 2081(b) (Incidental Take Permit)</td>
<td>Required if a project has the potential to affect state-listed listed or protected species or their habitats, either directly or indirectly.</td>
<td>n/a</td>
</tr>
<tr>
<td>State Historic Preservation Office</td>
<td>National Historic Preservation Act of 1966 (16USC470)</td>
<td>Section 106 Compliance</td>
<td>Required for actions that trigger a Clean Water Act Section 404 permit (see above) to ensure federal agencies consider the impact of their actions on historic properties and provide the Advisory Council on Historic Preservation with an opportunity to comment on projects before implementation.</td>
<td>Consult Tribal Historic Preservation offices (THPO)</td>
</tr>
</tbody>
</table>

**U.S. Army Corps of Engineers**

Projects that may modify or obstruct the navigable waters of the United States are subject to permitting requirements under Section 10 of the Safe Harbors Act. The USACOE has jurisdiction over Section 10 of the Rivers and Harbors Act, which requires that, “regulated activities conducted below the Ordinary High Water (OHW) elevation of navigable waters of the United States be approved/permitted by the U.S. Army Corps of Engineers (Rivers and Harbors Act).” By definition, “Navigable Waters” are, “those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce (USACOE).”
The U.S. Army Corp of Engineers also has authority over Section 404 of the Clean Water Act, which specifically deals with dredged or fill materials (USACOE). This permit is required to be issued before any point source discharge of dredged or fill material into the navigable waters of the United States (Clean Water Act). The United States Environmental Protection Agency has oversight of the Section 404 permits and may veto USACOE decisions regarding permitting approval.

Under Section 404 there are three types of permits: general, nationwide, and individual permits. The Nipomo Mesa Project will require an Individual Permit. The individual permit requires NEPA analysis. These permits may be subject to certain general, regional, or otherwise special conditions.

Approvals that are required before a Section 404 permit can be obtained include the following:

- NHPA/Section 106 Consultation
- California Coastal Commission Letter of Concurrence documentation that is consistent with the Coastal Zone Management Act
- Regional Water Quality Control Board 401 Water Quality Certification
- Federal ESA consultation

The Nipomo Mesa Project will likely require both the Individual Permit under Section 404 and the Section 10 permits.

**U.S. Fish and Wildlife Service**

Under the Endangered Species Act (ESA), there are two permit pathways, Section 7 and Section 10(1)(b), an applicant can go through to conduct their project when federally listed species are present. Since the Nipomo Mesa Project has the potential to disrupt federally listed species, one or both permit pathways will have to be completed. Section 7, Formal Consultation, is applicable when a project has a “federal nexus,” meaning that it is federally funded or requires a federal permit from another agency. For the Nipomo Mesa Project, a federal nexus does exist because of the Section 404 permit that will need to be issued thus, Section 7 can be applicable to the Nipomo Mesa Project. A formal consultation will occur if the permitting federal agency determines that adverse effects to federally listed species is likely; this process has a statutory requirement of 135 days. The US. Fish and Wildlife will then issue a biological opinion stating that the Nipomo Mesa Project will result in a “jeopardy” or “no jeopardy.”

Under Section 7, the federal nexus for the Nipomo Mesa Project will be the issuance of the Section 404 permit which will be limited to the wetlands and Little Oso Flaco. This means that only federally listed species in those areas will be considered for the formal consultation.
leaving other federally listed species not occurring in that area but within the Nipomo Mesa Project boundaries out of the consultation. Therefore, the Nipomo Mesa Project will also need the Section 10(1)(b) Incidental Take Permit for the remaining federally listed species. The Incidental Take Permit is necessary for any project that may adversely affect federally listed species which the Nipomo Mesa Project has the potential to do. "Take" as defined under the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (NOAA Fisheries)."

Section 10(1)(b) Incidental Take Permit also requires a Habitat Conservation Plan (HCP) which determines how project actions will affect wildlife species and habitats and outlines measures to minimize or mitigate harmful effects and/or improve conditions. This process has no time limit and may take several years to complete; further, it should be noted that this permit requires NEPA analysis.

It is recommended that both permit pathways, Section 7 and Section 10(1)(b), be pursued. Section 7 will require that the Section 404 permit process be initiated to conduct the formal consultation. Section 10(1)(b) will not require prior permit issuance but can be initiated once determined which federally listed species are not covered under Section 7.

Since the Nipomo Mesa Project includes a restoration component, there is a potential for the Nipomo Mesa Project applicant to obtain a Safe Harbor Agreement (SHA) from NOAA and USFW. This agreement helps to encourage such actions and provides an assurance that they will not be subject to any restrictions as a result of activities. This agreement will require NOAA and USFW to work with the landowner to develop baseline conditions, determine habitat improvement activities, and create objectives and goals for the property (NOAA Fisheries).

National Oceanic and Atmospheric Administration Permits (NOAA)

NOAA administers provisions of the ESA and Marine mammal Protection Act (MMPA), which must be considered in the approval of any project; NOAA Fisheries is responsible for endangered and threatened marine and anadromous species. Because there is a potential for the Nipomo Mesa Project to impact anadromous species (Steelhead Trout) and marine mammals via discharge, death of marine life via intake infrastructure, and plant and pipeline construction, NOAA will be involved for Section 7 consultations (NOAA Fisheries). As mentioned previously, Section 7 will require that the Section 404 permit process be initiated to conduct the formal consultation. Section 10(1)(b) will not require prior permit issuance but can be initiated once determined which federally listed species are not covered under Section 7.
All marine mammals are protected under the MMPA of 1972 (NOAA Fisheries). Any potential for the Nipomo Mesa Project to result in the take of a marine mammal, through construction, transportation activities, or operation may result in need for a MMPA permit.

The National Oceanic and Atmospheric Association’s permitting relates to the construction of the projected plan for the site. The issuance of permits will be based around the construction of pipelines running from the Nipomo Mesa Project site to the ocean. The Clean Water Act further insists that the discharge of sites associated with a project do not disturb the chemical, physical, and biological integrity of the National water resources.

Central Coast Regional Water Quality Control Board (RWQCB)

The Central Coast Regional Water Quality Control Board is responsible for administration of CWA section’s 401 and 404 in California. In addition, the RWQCB is responsible to regulate the Porter-Cologne Water Quality Control Act through the Waste Discharge Requirements Program, National Pollution Discharge Elimination System, and the construction General Permit or Storm Water Pollution Prevention Plan. These permits pertain to any waters within the boundary of the state including surface water, groundwater, saline waters, and wetlands. The RWQCB regulates an entire project in terms of its indirect and direct impacts on water quality. The Nipomo Mesa Project must comply with water quality standards for water quality objectives, anti-degradation policy, no net loss policy for wetlands, and designated beneficial uses.

In the case of the Nipomo Mesa Project, a CWA section 401 Water Quality Certification will be required for the CWA 404 Permit process to obtain an individual permit. Section 401 of Clean Water Act is enforced by the Regional Water Quality Control Board in California certifying that discharge will not violate state water quality standards prior to the issuance of a regional, national, or individual 404 permit. Under section 401, the RWQCB requires a water quality certification permit for any infrastructure requiring creek crossing, impacts to federal wetlands or vernal pools, etc., or construction of intake and outfall pipelines.

RWQCB regulates the Porter Cologne Act through the Waste Discharge Program which regulates all waste discharge in surface water through the prohibition of discharge and prescribing waste containment and treatment strategies. Section 13260(a) of the California Water Code requires any discharging waste in any region other than a sewer system which could affect the quality of the waters of the State to file a report of waste discharge. This includes an individual National Pollutant Discharge Elimination System (NPDES) Permit, which is specifically tailored to an individual facility, in this case the Nipomo Mesa Project site. The project applicant must apply through the appropriate water board and must describe wastes being discharged, setting of discharge, and method of treatment.
A Report of Waste Discharge (ROWD) is required under Section 13260 of the California Water Code for all new discharges, and the discharger must submit a technical report that characterizes the discharge and is signed and registered by a civil engineer. The Construction General Permit is required for discharges whose projects disturb one or more acre of soil. The General Permit for Discharges of Storm Water associated with Construction Activity is subject to any activity including clearing, grading, and ground excavation/disturbance. This requires the development of a storm pollution prevention program plan by a qualified SWPPP Developer.

The Water Quality Control Plan for the Ocean Waters of California (Ocean Plan) outlines the standards for ocean water to ensure that people can use and enjoy the resource without drastic impacts resulting from intake or pollution (State Water Resources Control Board, 2015). In 2015, an amendment regarding desalination plants was added to the Ocean Plan and provides a consistent permitting process for new or existing facilities (State Water Resources Control Board, 2020). The amendment directs regional water quality control boards on permitting, implementing, monitoring and reporting for new and existing facilities (State Water Resources Control Board, 2020). It delineates which technologies are preferred, salinity level limits, mitigation measures, and monitoring and reporting (State Water Resources Control Board, 2015). The Ocean Plan is pertinent to the Nipomo Mesa Project because it will contain a newly constructed desalination plant which will have to abide to the regulations.

**California State Lands Commission**

Under Title 2 (Administration), Division 3 (State Property Operations), Chapter 1 (State Lands Commission) of the California Code of Regulations, planned used on Public Trust lands require a lease agreement which is left to the discretion of the State Lands Commission (California Code of Regulations, 2021). Since the Nipomo Mesa Project contains portions within Public Trust lands, a lease agreement will have to be obtained to conduct the Nipomo Mesa Project. The aspect of the lease will be up to the Commission’s discretion which includes the category, amount of rental, if competitive bidding should be used, bond and insurance requirements, and a few other variables (California Code of Regulations, 2021).

**California Coastal Commission**

The California Coastal Commission is responsible for permit issuance for projects within the coastal zone of California. This accounts for developments within one thousand yards of the high tide line. The current project plan consists of pipelines that would facilitate the pumping of ocean water to the Nipomo Mesa Project site therefore requiring permits from the CCC.
This will require the issuance of a Coastal Zone Development Permit for the further development of the Nipomo Mesa Project plan.

Sections 30230, 30231, 30233, 30236, and 30240 of the Coastal Act apply to the preservation and protection of wetlands and other environmentally sensitive areas. Regulation of the development and alteration of wetlands includes any actions resulting in diking, filling, dredging of wetlands. Any development must be the least environmentally damaging alternative, and mitigation measures are required. Regarding CWA Section 404, approval from the California Coastal Commission is required before receiving a 404 permit. This approval is the Letter of Concurrence need for projects located in the Coastal Zone, which is required 6 months after submission.

California Department of Fish and Wildlife Permits

In addition to the federal permits that the Nipomo Mesa Project will need for federally listed species, a permit for state listed species occurring within the Nipomo Mesa Project site will also be required. An Incidental Take Permit (ITP), like the Federal ITP, will be needed since the Nipomo Mesa Project has the potential to impact state listed species.

The California Department of Fish and Wildlife as espoused by themselves is to manage sea life and plants as well as their habitats for ecological stability. The California Endangered Species Act is a permitting concern in relation to section 2081 Incidental Take. This occurs due to the potential to adversely affect existing state protected wildlife, plants, or their habitats, these species of special concern (CSC) can be directly or indirectly affected.

Fish and Game Code Section 1602 is another permitting issue pertaining to the Lake and Streambed Alteration Agreement – FGC Sec. 1 1602. Focusing on the deposition or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any rivers, streams, or lakes.

State Historic Preservation

The National Historic Preservation Act of 1966 was passed to ensure that cultural and historical foundations are preserved (Advisory Council on Historic Preservation, n.d.). Section 106 of the Act requires any project with federal agencies involved to consider the historic preservation present within the Nipomo Mesa Project area (Advisory Council on Historic Preservation, n.d.). The Nipomo Mesa Project is subject to Section 106 because of the need for the Section 404 permit. The federal agency, or the lead federal agency when multiple agencies are involved, will oversee the documentation and the State Historic Preservation Office (SHPO) assists the federal agency throughout the process (Advisory Council on Historic Preservation, n.d.).
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Summary of Findings

This report summarized constraints and gave recommendations for the construction and operation of a desalination plant and a land restoration project on the Philips 66 Santa Maria Refinery land. The four issue areas discussed in the report are biological, cultural, geology and soils, and recreational resources. The impacts to biological resources were evaluated using existing biological databases and it was determined that there are sensitive species and habitats that have the potential to be impacted by the Nipomo Mesa Project. Recommendations to avoid these impacts include but are not limited to: considering migratory birds in the timing of the pipeline construction, monitoring the pipeline for leaks, and implementing BMPs for restoration.

Cultural resources was the second issue area analyzed. Around 50% of the California Coastal zone has been designated as archeologically sensitive and the Nipomo Mesa Project site is a known historical site used by indigenous groups. Therefore, recommendations include field surveys and investigations to determine potential significant impacts. If significant cultural resources are identified, avoidance is recommended as the primary form of mitigation.

The third issue area was geology and soils. Research determined that the Nipomo Mesa Project site is dominated by highly erodible sandy soils. Nearby fault lines give the site medium potential for liquefaction and ground shaking. Recommendations include monitoring wind erosion and planning carefully around areas of high liquefaction potential during construction.

The last issue area analyzed was recreational resources. It was determined that the desalination plant would not pose significant long-term impacts to recreation. Instead, the land restoration would eliminate the opportunity for new recreation on the Nipomo Mesa Project site. Surveys to gauge public sentiment towards the loss of opportunity of new recreational facilities are recommended.

A map of the most prevalent environmental constraints that the Nipomo Mesa Project would have was created to visually demonstrate where they occur in relation to the site boundaries (Figure 18). A sensitive resource area, riparian vegetation, terrestrial habitat, and high liquefaction hazards occur along the coastal border of the Nipomo Mesa Project. Furthermore, the Nipomo Mesa Project site is near waterways and wetlands which are sensitive areas. These environmental constraints need to be considered as the Nipomo Mesa Project is further developed because of the impacts it will have on these resources.

The report also summarized the local, state, and federal permits that the Nipomo Mesa Project would require. At the county level, the Nipomo Mesa Project is subject to Title 23 (Coastal Zone Land Use) of the San Luis Obispo County Code. Steps would need to be taken to ensure compliance with the Clean Water Act, federal and state Endangered Species
Nipomo Mesa Project

Acts, the Rivers and Harbors Act, the National Historic Preservation Act of 1966, Section 1602 of the California Fish and Game Code, and others.

In the future, this document could serve as a communication and outreach tool. This document could help in the compilation of environmental data. It could be used to develop ideas for future analysis and further studies. Finally, it could help create opportunities, offer evaluation of alternative design and land uses.
Figure 19. Map of Nipomo Mesa Desalination Plant’s constraints
List of Preparers

This Environmental Constraints Report was compiled by DUNES Environmental Group from the California Polytechnic State University, San Luis Obispo Natural Resources Course 425: *Applied Resource Analysis and Assessment* taught by Sarah Spann. Table 6 provides the names, majors, and responsibilities of the members of DUNES Environmental Group.

Table 6. List of Preparers

<table>
<thead>
<tr>
<th>Name</th>
<th>Primary Responsibilities</th>
<th>Education</th>
</tr>
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<tbody>
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<td>Gissella Quiroga</td>
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</tbody>
</table>
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Nipomo Mesa Project


Appendices

Appendix A. Detailed discussion of endangered species occurring within the Nipomo Mesa Project boundaries.

Plants

**California Jewelflower (Caulanthus californicus) - Endangered**

The California jewelflower is an annual herb in the Brassicaceae family. The plant’s range includes the southern San Joaquin Valley and the western transverse ranges (Jepson eFlora, n.d.). It is endangered wherever it is found and has no designated critical habitat (USFWS, IPaC, n.d.).
**Gambel’s Watercress (Rorippa gambelii) - Endangered**
The Gambel’s watercress is a perennial herb in the Brassicaceae family. It occurs in the southern central coast and the south coast of California; it is also found in Mexico (Jepson eFlora, n.d.). The species is endangered wherever it is found and has no designated critical habitat (USFWS, IPaC, n.d.).

**La Graciosa Thistle (Cirsium loncholepis) - Endangered**
La Graciosa thistle is a perennial herb in the Asteraceae family, and it only occurs in the southern central coast of California (Jepson eFlora, n.d.). This species is endangered wherever it is found and does have designated critical habitat that overlaps with the Nipomo Mesa Project boundary (Figure 6) (USFWS, IPaC, n.d.).

**Marsh Sandwort (Arenaria paludicola) - Endangered**
The marsh sandwort is a perennial herb in the Caryophyllaceae family. This plant’s range extends from the south coast to the central coast and the San Francisco Bay (Jepson eFlora, n.d.). The species is endangered wherever found and does not have a designated critical habitat (USFWS, IPaC, n.d.).

**Nipomo Mesa Lupine (Lupinus nipomensis) - Endangered**
The Nipomo Mesa lupine is an annual herb in the Fabaceae family. It only occurs on the Nipomo Dunes located in the southern central coast of California (Jepson eFlora, n.d.). It is endangered wherever it is found and does not have a designated critical habitat (USFWS, IPaC, n.d.).

**Pismo Clarkia (Clarkia speciosa ssp. Immaculata) - Endangered**
The Pismo Clarkia is an annual herb in the Onagraceae family. This subspecies only occurs from Pismo Beach to Edna in the central coast of California (Jepson eFlora, n.d.). It is endangered wherever it is found and does not have a designated critical habitat (USFWS, IPaC, n.d.).

**Salt Marsh Bird’s-beak (Cordylanthus maritimus ssp. maritimus) - Endangered**
The salt marsh bird’s-beak is a hemiparasitic annual herb in the Orobanchaceae family (CNPS). This subspecies occurs in the southern coast of California and can be found in northern Baja California (Jepson eFlora, n.d.). The plant is endangered wherever found and does not have a designated critical habitat (USFWS, IPaC, n.d.).

**Spreading Navarretia (Navarretia fossalis) - Threatened**
The spreading Navarretia is an annual herb in the Polemoniaceae family. It occurs in the southern south coast ranges, Mojave Desert, and southwestern California (Jepson eFlora, n.d.). The plant is threatened wherever found and has critical habitat that does not overlap with the Nipomo Mesa Project boundary (USFWS, IPaC, n.d.).
Figure 20. La Graciosa Thistle critical habitat within the Nipomo Mesa Project boundary
Wildlife

Birds

Raptor and migratory bird species protected under the Migratory Bird Treaty Act (16 USC 703-712); CDFG Code Section 3503, and CDFG Code Section 3503.5 may occur within the area. These include ground nesters (western meadowlark), small tree/shrub nesters (bushtit, American robin, loggerhead shrike, house finch) and several raptors (turkey vulture, red-tailed hawk, red-shouldered hawk, great-horned owl, barn owl, white-tailed kite and Cooper’s hawk) (Trotter et al., 2007). The following are those bird species that are of particular concern within the Nipomo Mesa Project area; however, this list is not exhaustive and would require a more detailed land survey to determine occurrences of species.

**Western Snowy Plover (Charadrius alexandrinus) - Threatened**

The Western Snowy Plover is a migratory shorebird that is a federally threatened species and a California species of special concern (USFWS, IPaC). The coastal population inhabits beaches and estuarine shores that lie within and around the Nipomo Mesa Project site. They are known to inhabit areas from the southwestern Guadalupe Dunes to the Northwestern Pismo Beach (USFWS, IPaC). The USFWS has designated critical habitat for the Snowy Plover, which extends along the coast from just north of Arroyo Grande Creek south through the southern end of Oceano Dunes SVRA (see Map.) They also reside in the Guadalupe-Nipomo Dunes National Wildlife Refuge that lies directly west of the Nipomo Mesa Project site (Mountain, 2016). National Wildlife Refuges are designated spaces set aside to conserve species that are managed by the U.S. Fish and Wildlife Service (USDOI).

**California Least Tern (Sterna antillarum brownii) - Endangered**

The California Least Tern is a migratory bird that is protected under the Federal and California Endangered Species Acts as endangered. Their range extends along the coast from Baja, CA to San Francisco, CA (See Figure 7). They primarily nest on sandy beaches and are threatened by human activities, construction, and industrial development (USFWS, IPaC). They can be found within the nearby Guadalupe-Nipomo Dunes National Wildlife Refuge to the west of the Nipomo Mesa Project site, and due to their migratory nature, could potentially be observed within the Nipomo Mesa Project site boundaries.

**Least Bell’s Vireo (Vireo bellii pusillus) - Endangered**

Least Bell’s Vireo is a State and Federally listed endangered species and primarily inhabits riparian scrub edges and riparian forests. This species has not been observed in the Nipomo Creek riparian habitats, but it is entirely possible that the species forages within or adjacent to the Nipomo Mesa Project site area (USFWS, IPaC).
Marbled Murrelet (Brachyramphus marmoratus) - Threatened
The Marbled Murrelet is a rare and threatened seabird that occurs in nearshore marine habitats along the west coast. They primarily inhabit the coast from Santa Cruz to Alaska, but have also been known to use San Luis Obispo County for feeding during late summer. While it is rare that they would occur within the Nipomo Mesa Project site, there is still potential for them to migrate into the boundaries at some point for foraging. (Audubon Society)

Southwestern Willow Flycatcher (Empidonax traillii extimus) - Endangered
The Southwestern Willow Flycatcher is listed as a Federally endangered species. It is a small neotropical migrant bird that inhabits southern California, southern Nevada, southern Utah, southern Colorado, Arizona, New Mexico, western Texas, and northwestern Mexico (Audubon Society). There is designated critical habitat located south of the Nipomo Mesa Project site for the Southwestern Willow Flycatcher (USFWS). Though not directly observed in the Nipomo Mesa Project area, the proximity to the designated habitat makes it likely for them to enter the site at some point in time.
Figure 21. Habitat map of Least Tern and Snowy Plover within the Nipomo Mesa Project boundary.
Invertebrates

**Monarch Butterfly (Danaus plexippus) - Sensitive**
The monarch butterfly does not have a listing status, but is cited as a sensitive species by the CNDDB and is considered a species of local concern in San Luis Obispo County (USFWS, IPaC). The listing is based on limiting wintering sites along the Central Coast region of their range, which includes the Nipomo Mesa Project site.

**Mammals**

**Giant Kangaroo Rat (Dipodomys ingens) - Endangered**
The Giant Kangaroo Rat is a Federally and Nationally endangered species found on sandy loam soils in sparse vegetation throughout California (USFWS, IPaC). They are known to develop vast burrowing systems and are primarily nocturnal. It is considered a keystone species; many other species, such as the blunt-nosed leopard lizard depend on it for their survival (USFWS, IPaC). They have been observed to reside within the Nipomo Mesa Project boundaries. A nearby sub-species, the Morro Bay Kangaroo Rat, is critically endangered and individuals could potentially show up in or around the Nipomo Mesa Project site (USFWS).

**Pallid bat (Antrozous pallidus) - Species of Special Concern**
The Pallid bat is a California species of special concern with a range from central Mexico to southern Canada and East to Oklahoma. Prime roosting habitat includes caves, mines, hollow trees, and rocky outcroppings. The Pallid bat has been documented in and around the Nipomo Mesa Project site area (Central Coast Bats, 2019).

**Amphibians and Reptiles**

**California red-legged frog (Rana aurora draytonii) - Threatened**
The California red-legged frog is a federally listed threatened species and a California species of special concern that occurs in coastal drainages (NCSD Technical Memorandum). They are currently threatened by habitat loss due to urbanization, overgrazing, invasive plant species, degraded water quality, and predation. The California red-legged frog has been observed around the Nipomo Mesa Project site, so it has the potential of being present within the Nipomo Mesa Project site boundaries, especially around or near Black Lake, Oso Flaco Lake, Little Oso Flaco Lake, and any other ponds or water sources (USFWS, IPaC).

**Coast horned lizard (Phrynosoma coronatum frontale) - Species of Special Concern**
The Coast horned lizard is a federal species of concern and a California species of special concern that occurs in a variety of open habitats that provide sites for basking (USFWS). The coast horned lizard has the potential to occur throughout the Nipomo area and faces
threats from fragmentation, development, invasive species impacts, grazing, and climate change (USFWS.)

Southwestern pond turtle (Clemmys marmorata pallida)- Species of Special Concern
The southwestern pond turtle is a federal species of special concern and a California species of special concern (USFWS, IPaC). It is an aquatic turtle inhabiting streams, marshes, ponds, and irrigation ditches within woodland, grassland, and open forest habitats, but needs upland sites for wintering and nesting activities (USFWS). Southwestern pond turtle was observed in Nipomo Creek in a survey conducted by Padre in July 2004 (NCSD Technical Memorandum), meaning it has the potential to occur within Nipomo Creek area and thus, within the Nipomo Mesa Project site boundaries.

Two-striped garter snake (Thamnophis hammondi)- Species of Special Concern
The two-striped garter snake is a California species of special concern which is highly aquatic and is typically found in streams and ponds in chaparral and oak woodland habitats (USFWS). This species occurs throughout southern California streams, including the central coast. The species has disappeared from more than 40% of their range due to habitat conversion, urbanization, livestock grazing, and invasive species impacts (USFWS).

Blunt-nosed Leopard Lizard (Gambelia silus)- Endangered
The blunt-nosed leopard lizard is a Federally and State listed as endangered (USFWS, IPaC). They typically live in sandy soils and in expansive areas with sparse vegetation (USFWS, IPaC). They face habitat loss due to petroleum extraction, ORV use, construction, and infrastructure (USFWS, IPaC). Their range expands into San Luis Obispo and Santa Barbara Counties and thus have the potential to be found within the Nipomo Mesa Project Site boundaries (USFWS).

California Tiger Salamander (Ambystoma californiense)-Threatened/Endangered
The California Tiger Salamander is a regionally threatened species, but is listed as endangered in Santa Barbary County and Sonoma County (USFWS, IPaC). The species is confined to grasslands and foothills with ponds for breeding (USFWS). They typically live in burrows made by squirrels and burrowing species. They will likely become endangered in the Central Coast in the foreseeable future due to habitat fragmentation and rodent control plans as well as pesticides and contaminated runoff from highways and population centers (USFWS).

Fish

Tidewater Goby (Eucyclogobius newberryi)-Endangered
The Tidewater Goby is Federally listed as endangered and is endemic to California (USFWS, IPaC). It is found in waters of coastal lagoons, marshes, and estuaries. The Tidewater Goby has been found to inhabit much of the ponds and streams in the Nipomo Mesa Project Site (USFWS, IPaC).
Environmental Constraints Analysis (ECA)

NIPOMO MESA DESALINATION PLANT PROJECT

2555 Willow Road, Arroyo Grande, CA 93420

Prepared for Central Coast Economic Recovery Initiative, Cal Poly Institute for Climate Leadership and Resilience, and Oceano Economic Development Council

By Grey Pine Consulting, Cal Poly NR 425
Spring 2021

Disclaimer: The following document has been prepared as part of the undergraduate curriculum for NR 425 (Applied Resources Analysis and Assessment) at California Polytechnic State University, San Luis Obispo. The intent of this academic exercise was to simulate the real-world process of preparing an environmental constraints and permitting analysis; however, it is important to note that the environmental and permitting constraints identified herein have not been technically reviewed by subject matter experts. This document is to be used for informational purposes only.
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List of Acronyms

AFY – Acre-Feet Per Year
AOI – Area of Interest
APCD – Air Pollution Control District
CDFW – California Department of Fish and Wildlife
CESA - California Endangered Species Act
CEQA – California Environmental Quality Act
CWA – Clean Water Act
ECA – Environmental Constraints Analysis
EIR – Environmental Impact Report
ESA – Endangered Species Act
ESHA – Environmentally Sensitive Habitat Area
GIS – Geographic Information System
HCP – Habitat Conservation Plan
LCP – Local Coastal Program
LSA – Lake and Streambed Alteration Program
MOA – Memorandum of Agreement
NEPA – National Environmental Policy Act
NMPDD – Nipomo Mesa Desalination Plant Project
NOAA - National Oceanic and Atmospheric Administration
NPDES – National Pollution Discharge Elimination System
NRCS – Natural Resources Conservation Service
ODSVRA - Oceano Dunes State Vehicular Recreation Area
PCH – Pacific Coast Highway
RWQCB – Regional Water Quality Control Board
SHA - Safe Harbor Agreement
SHPO - State Historic Preservation Office
SMR - Santa Maria Refinery
SWRO – Sea Water Reverse Osmosis
TDS – Total Dissolved Solids
USACOE – United States Army Corps of Engineers
USFWS – United States Fish and Wildlife Service
USGS – United States Geological Survey
WDID – Waste Discharge Identification Number
1. Introduction

The intent of the Environmental Constraints Analysis (ECA) is to identify and discuss possible environmental limitations of the Nipomo Mesa Desalination Plant Project (NMDPP), to be located in San Luis Obispo County, California. The NMDPP is a potential option (which an applicant could pursue) for repurposing the parcel of land currently occupied by the Phillips 66 Santa Maria Refinery (SMR) that is scheduled to be decommissioned in 2023.

Grey Pine consulting, featuring five students from Sarah Spann’s NR 425 class of upperclass Cal Poly students, will work together to create a comprehensive ECA specific to the NMDPP. The remainder of this document will provide various sections such as a detailed description of the project, an analysis of potential stakeholders, an analysis of potential environmental constraints, information about the likely processes and permits needed, and a summary of the findings. To provide ample information, a wealth of synthesized research is compiled and figures and tables to complement the relevant discussions.

1.1 Project Purpose and Need

The NMDPP, specifically located in Arroyo Grande, California near the Oceano Dunes, provides excellent opportunity for industrial development as well as an opportunity to aid the biodiversity of a unique landscape. The purpose of this project is to repurpose the Phillips 66 SMR site to serve the needs of the local community and the environment. Habitat restoration efforts, specifically of the nearby Little Oso Flaco Creek, will help to reverse years of degradation caused by the SMR and neighboring Oceano Dunes State Vehicular Recreation Are (ODSVRA), while the addition of a desalination plant to the area will continue to provide local jobs and municipal water as the state of California experiences worsening drought conditions.

1.2 Purpose and Scope of the Environmental Constraints Analysis

The purpose of this environmental constraints analysis is to identify key resources that may be significantly impacted by all parts of the project. The firm will provide information on stakeholders, the environmental issue areas, and the project itself. Additionally, this report will analyze local regulations and give insight into details that are likely to receive pushback from the public eye or governmental regulations. This information will be used at the client’s discretion to be more aware of issues that are likely to come up from the project and to help draft alternatives.

2. Project Description

To understand the regulatory hindrances this project may face, it is important to understand the different phases and components. In the following, the project description will include information on the location of the site, a discussion on the existing site characteristics, the project objectives, the different phases of the project, and a description of the separate components of the desalination plant. There are also a wealth of maps, figures, and diagrams to aid this project description.
2.1 Project Location
The Nipomo Mesa Desalination Project is located on the Central Coast of the State of California in an unincorporated area of San Luis Obispo County. It is adjacent to the small community of Callender, South of Oceano and East of Nipomo. To the West of the project site lies the Oceano Dunes State Vehicular Recreation Area (ODSVRA) and the Pacific Ocean, and to the South is Santa Barbara County and the Vandenberg Air Force Base.

Figure 1: Greater region surrounding the Phillips 66 Santa Maria Refinery in San Luis Obispo County, California
2.2 Existing Site Characteristics

2.2.1 Current and Historic Use

The project is located on 1,780 acres of the Nipomo Mesa in unincorporated San Luis Obispo County near Arroyo Grande, California. The site is currently owned by Phillips 66 and is the location of their Santa Maria Refinery. The refinery encompasses about 200 acres of the total site, with the remainder used as a buffer area or for cattle grazing (Phillips 66, n.d.). The Union Pacific Railroad divides the site into an East and West section, and it is bordered to the west by the ODSVRA. To the north of the site lies Black Lake, and to the southwest lies Little Oso Flaco Lake and the Oso Flaco Creek. The site is bounded to the north and east by State Highway 1.

The refinery on the project site was originally built in 1955 and operated by UNOCAL until 1997. Since then, it has also been owned by Tosco, Phillips Petroleum, and ConocoPhillips. It is linked by a 200-mile pipeline to the Rodeo Refinery in the San Francisco Bay Area, also owned by Phillips.
66 (MRS, 2014). The SMR receives crude oil from various sources and processes about 44,500 barrels of crude oil per day, employing 140 full time workers in addition to specialized contractors (Phillips 66, n.d.). The semi-refined petroleum produced is piped to the Rodeo Refinery, solid petroleum coke is transported by rail or haul truck, and solid recovered sulfur is transported by haul truck (MRS, 2014). Phillips 66 announced in August of 2020 that the SMR would be shutting down in 2023, with the associated pipelines phased out of service beginning in 2024 (Gannon, 2020).

2.2.2 Planning Area

The project site is located in the southwestern corner of San Luis Obispo County, approximately 3.5 miles west from the community of Nipomo. This falls within the South County Coastal Planning Area, with the exception of a small section of the farthest east parcel which lies in the South County Inland Sub-Area of the South County Planning Area (Dier, 2021b).

Figure 3: Planning Areas occupied by the project site in San Luis Obispo County, California.
2.2.3 Land Use/Zoning

The entirety of the project site located to the west of the Union Pacific Railroad is under the Open Space land use designation. To the east of the railroad tracks, the majority of the site is under the Industrial designation, with the exception of the farthest east parcel which is designated as Agriculture (Dier, 2020a).

The land uses surrounding the project site are primarily Recreation, Agriculture, and Open Space. To the northwest and west in the direction of the community of Nipomo there are Residential, Commercial, and Office and Professional land uses as well (Dier, 2020a).

![Map of Phillips 66 Santa Maria Refinery Site Surrounding Land Uses](image)

*Figure 4: The designated land uses of the project site and the greater area in San Luis Obispo County, California*
The entire project site is listed under the Coastal Zone combining designation (Dier, 2021a). The southern edge of the project site borders, and slightly enters, the 100-year flood zone of the Oso Flaco creek (Dier, 2021c). Thus, the entire project site, with the exception of the northernmost parcels, is under the Flood Hazard combining designation. All of the project site to the west of the Union Pacific Railroad is under the Sensitive Resource (Dier, 2020b) as well as the Coastal Zone Terrestrial Habitat combining designation (Dier, 2020c). A small section of the southwest parcel is under the Wetland combining designation (Dier, 2021d).

2.2.4 Site Access
The project site is accessed through two entry points approximately 350ft from each other at 2555 Willow Road, which is also known as State Highway 1.
2.2.5 General Environmental Conditions
The project site is located on the Nipomo Mesa in a coastal dune biome. This region experiences a coastal Mediterranean climate, with dense fog common in morning during late spring and summer months. This area receives an average of 44 days of rain annually and an average of 15 inches of rain per year (Nall, 2019).

The project site, particularly the eastern half, falls within the Guadalupe-Nipomo Dunes, labeled by The Nature Conservancy as “the largest intact coastal dune ecosystem on Earth” and classified as National Natural Landmark. This ecosystem supports critical habitat for the threatened Western Snowy Plover and other sensitive and listed species under the California and Federal Endangered Species Act. The entirety of the bordering ODSVRA is designated as an Environmentally Sensitive Habitat Area (ESHA) (California Coastal Commission, 2021). Furthermore, in studies for a previous Minor Use Permit by Phillips 66 for their Northern Inactive Waste Site, it was determined that unmapped ESHA sites were documented on at least 1.38 acres of the project site (Nall, 2019).

The project site parcels are located within the Santa Maria River Valley Groundwater Basin and the South Coast Water Planning Area. This groundwater basin is adjudicated and listed as very low issue priority under the Sustainable Groundwater Management Act with 0 priority points (California Department of Water Resources, 2021).

2.3 Project Objectives
The project objectives are multifaceted, aiming to address issues in the San Luis Obispo County region spanning from socioeconomic resource issues to environmental issues. This ECA will identify the environmental constraints associated with all phases of the project after remediation of the site, which is to be completed by the applicant. Specific objectives are as follows:

- Mitigate the impacts of the COVID-19 pandemic on the Central Coast region through economic recovery plan that focuses on clean energy investment, sustainable tourism, and creation of jobs
- Increase resilience of local economy to withstand future economic shocks through strategies that seek to make the regional economy more economically and environmentally resilient and diverse
- Utilize the untapped potential of talent and resources in local community through collaboration and inter-agency partnerships
- Work to resolve the water supply issues of the region through desalination of ocean water
- Reduce stress on groundwater basins in the region by providing an alternative water source
- Remediate former refinery site and repurpose refinery facility
• Preserve habitats and ecosystems located within the project site, as well as the nearby Environmentally Sensitive Habitat Area (ESHA), Oso Flaco Creek, freshwater lakes, and Pismo Dune area

2.4 Project Phases

This section provides a general overview of the major phases that would be required to repurpose the existing project site and develop and operate a desalination facility. The three primary phases include refinery decommissioning and remediation, desalination plant construction and operation, and environmental restoration. An additional step for project funding, design, and approval would occur before the desalination plant could be built; however, this report will focus on the phases that will affect the physical, biological, and chemical properties of the site.

2.4.1 Phillips 66 Santa Maria Refinery Decommissioning and Remediation

Before any new development can occur on the Project site, the existing Phillips 66 Santa Maria Refinery facility must be decommissioned and remediated. Historically, oil refinery locations have been found to carry large deposits of coal and petroleum in their soils long after the refineries are closed. It is also important to note that groundwater is historically known to be contaminated by oil refineries. Currently, the US EPA has the Phillips 66 Santa Maria Refinery site location listed as one of the locations in their “Cleanups in My Community” and the groundwater migration action is currently listed as “Not Controlled” (United States Environmental Protection Agency, n.d.). This location may potentially need remediation for groundwater resources as well and another preliminary study to analyze the current existing conditions of the groundwater should be performed.

Decommissioning plans need to be prepared and executed alongside environmental permitting authorizations. Planning, engineering, environmental studies and compliance, removing piping, removing platforms, and disposing of waste are major steps in decommissioning an oil refinery (NES Fircroft). For the purposes of this analysis, it is assumed that the decommissioning and remediation process would be completed by the current owner of the property. Addressing the potential environmental impacts associated with the decommissioning and remediation phase is outside of the scope of this report.

2.4.2 Desalination Plant Construction and Operation

Construction and operation of the proposed desalination plant would occur entirely within the existing 183.6-acre refinery facility footprint located on Assessor Parcel Number (APN) 092-401-011 and APN 092-401-005. The location of support infrastructure (e.g., pipelines, transmission lines, etc.) is unknown at this time and should be designed based on the results of the constraints analysis.

The phase of construction is likely the most costly and time consuming phase. Construction is broken up into repurposing the existing site for the desalination plant and upgrading infrastructure. Due to the differences between an oil refinery and a desalination plant, it is
assumed that none of the existing facilities would be reused other than the roads. The pipelines, utilities, and electrical services that would accommodate the desalination plant do not match the facilities currently in use by the Phillips 66 Santa Maria Refinery. The current roads would be used for construction of the new desalination plant as well as be re-used for access to and from the plant when it is fully opened.

New infrastructure would consist of pipelines, buildings, filtration systems, pumping stations, and waste treatment. Additional details regarding the infrastructure required for a desalination facility is included in the “Desalination Plant Components” section below. In addition, due to the increased need for electrical power, it is assumed that the construction phase would include the development of new transmission lines and other required infrastructure upgrades.

2.4.3 Ecological Restoration
Another key phase of the proposed project involves the ecological restoration of the remainder of the Phillips 66 property located outside of the current facility footprint. This includes approximately 1,645 acres located on the following APNs: 091-141-062, 092-391-034, 092-391-020, 092-391-021, 091-192-034, 092-401-005, 092-401-011, 092-401-013, 092-411-005, and 092-411-002.

Restoration efforts will be directed towards improving the environmental and ecological condition of the degraded dune habitat and the degraded Little Oso Flaco Creek. Restoration efforts can take a variety of years based on the ecosystem being restored, the goal of restoration, and the funding and support for the restoration. For the project site, restoration would occur after the majority of the infrastructure was built and would continue for several years to account for ongoing monitoring and adaptive management measures.

2.5 Desalination Plant Components
The proposed desalination plant is recommended to be constructed on the 200 acres (of the 1,780-acre property) currently occupied by the Phillips 66 Santa Maria Refinery campus as to avoid occupying any undisturbed land or habitats. This section will provide an overview of the typical components of a seawater reverse osmosis (SWRO) desalination plant. Reverse osmosis is a widely employed water purification technology and is the leading process for desalination. Reverse osmosis uses applied pressure to induce water permeation through a semipermeable membrane while omitting salts. This process uses less energy than most thermal distillation technologies. This process also requires extensive pretreatment to prevent critical failure of the membrane during operation.

Desalination plants can vary significantly in size, based on desired output. For reference, the largest desalination plants in California are found in Carlsbad and Huntington Beach. Both facilities were designed to produce 50 million gallons per day (MGD) or 56,000 acre-feet per year (afy) of potable water. The Carlsbad beach desalination facility occupies a 4-acre parcel. The Huntington Beach plant spans 11 acres.
Due to the lack of project design details or guidelines, this report provides three options for possible desalination plant sizes, production amounts, and energy consumption values (refer to Table 1: Typical Desalination Plant Size) based off California water trends and residential energy consumption data (Peterson, 2017) (Brown, 2017). The actual size of the desalination plant will be decided by the stakeholders and based on local limiting factors such as available industrial zoning space, energy consumption, amount of water produced, and is that water enough to supply an appropriate amount of community members.

<table>
<thead>
<tr>
<th>Water Production Supply (Daily Average)</th>
<th>Community Household Supply (Daily Average)</th>
<th>Energy Consumption by Plant (Daily Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 million gallons</td>
<td>375,000 gallons</td>
<td>405 mwh (megawatt hours)</td>
</tr>
<tr>
<td>50 million gallons</td>
<td>625,000 gallons</td>
<td>675 mwh</td>
</tr>
<tr>
<td>80 million gallons</td>
<td>1,000,000 gallons</td>
<td>1,060 mwh</td>
</tr>
</tbody>
</table>

The following paragraphs provide additional details regarding the typical components required for the construction and operation of a SWRO facility (refer to Figure 6: Example SWRO Facility Schematic).

**Intake System**  
The first step in a desalination treatment plant is the intake of ocean water and delivery to the plant. The intake location and type can vary - onshore intake, offshore intake, deep-water intake, and sub-seafloor intake are all potential options. The use of beach wells would substantially increase the risk of seawater intrusion into the regional groundwater basin. The inflow structure
is subject to regulation by the EPA due to potential impacts to aquatic wildlife. The proposed solutions to these potential impacts include withdrawing water at such a rate as to allow wildlife to escape the intake structure or locating the intake structure outside areas of high biological productivity.

For the purposes of this analysis, we are assuming that an offshore intake pipeline would be installed along with an onshore pumping station located at the plant facility. This would allow the plant operators to control the speed of the pumping and the quantity of water being pulled through the intake system. A gate valve can be built to control the flow and a screening system can be installed to remove larger particles. For example, at the Sydney Desalination Plant, a drum screen filters out particles that are 3 millimeters or more in diameter (Sydney Desalination Plant, n.d.). The Sydney plant has their offshore structure 300 meters offshore with intakes resting on the ocean bed 25-30 meters below the surface. The intake rate is very low in order to not harm the nearby wildlife and they also built artificial reefs around the intakes.

It is assumed that the construction of the pipeline would be completed through one of the three trenchless methods: horizontal directional drilling (HDD), micro-tunneling, or auger boring. HDD requires that a pilot hole be created and once complete it is enlarged to fit the pipeline by “pre-reaming” it. The pipeline is then attached to the reamer which is connected to the drill string. A drilling rig is then used to pull the attached reamer and pipeline to the other side. Installing a pipeline via the micro-tunneling method encompasses utilizing “a remotely controlled micro-tunnel boring machine combined with the pipe jacking technique.” The auger boring method creates a bore hole using a rotating cutting head. HDD and micro-tunneling can lead to hydro-fracturing while auger boring has limitations on accuracy and where it can be used (Monaco, 2005).

Pretreatment Facilities
Pretreatment is the first stage of the desalination process. When seawater arrives at the plant, it goes through a pretreatment process to remove particulates, debris, microorganisms, suspended solids and silt from the source seawater prior to reverse osmosis separation. In actuality, however, pretreatment systems remove most but not all of the suspended solids contained in the seawater. The suspended solids, particulates and silt that remain after pretreatment accumulate on the surface of the RO membranes and cause loss of membrane productivity over time. In addition, because seawater naturally contains bacteria as well as dissolved organics, a biofilm of bacteria can form on the membrane surface.

Two types of pretreatment systems are typically used to protect the SWRO membranes from fouling: conventional granular media filtration and membrane filtration. Currently, conventional granular media filtration is the predominant pretreatment technology for large and medium size desalination plants (Voutchkov, 2009). In this process, seawater is pumped into multimedia filter tanks, which typically include layers of anthracite and sand atop a bed of gravel (refer to Figure 7: Conventional Granular Media Filtration). The filtered material is then separated out and pumped back to the ocean.
Before seawater enters the reverse osmosis filters to remove the salt particles, it must go through a second stage of pretreatment called microfiltration to remove smaller (oftentimes microscopic) impurities. At this point, virtually all impurities other than dissolved salts and minerals have been removed from the water, but it still needs to go through one more step to remove the dissolved salts and minerals to be ready for drinking. Once filtered, the water moves into the next stage of desalination.

Reverse Osmosis Treatment Facilities
The RO treatment is the center of the desalination process. RO systems leverage a semi-permeable membrane to remove ions, molecules, and unwanted contaminants and particles (salt in the case of desalination) from water. Reverse osmosis works by pushing water — under intense pressure — through semi-permeable membranes to remove dissolved salts and other impurities (refer to Figure 8: Example Pressure Vessel). High pressure pumps carry the water through the membranes. Much of the energy expended by the high-pressure pump is not used. Thus, an energy recovery device can be installed to reduce the total energy demand by 30%.
These membranes act like microscopic strainers that allow only water molecules to pass through, leaving behind the salt, minerals and other impurities such as bacteria and viruses. At the Tampa Bay Seawater Desalination Facility, the membrane pore size is 0.001 microns or 1/100,000th the size of a single human hair (Tampa Bay Water, 2010). At the Sydney Desalination Plant, there are 8 membranes per pressure vessel with a total of 36,000 membranes installed in the system (Sydney Desalination Plant). The size of the RO facilities will vary greatly depending on the water production capacity of the facility. For example, the Carlsbad Desalination Plant RO building contains more than 2,000 pressure vessels housing more than 16,000 reverse osmosis membranes.

**Post Treatment Facilities**
After the RO process, water typically undergoes chemical conditioning in product water post treatment facilities. Lime and carbon dioxide are used for post-treatment stabilization. The water then goes through a process called chloramination where chlorine is added in the form of ammonia and sodium hypochlorite to disinfect the water to the standards of the local health services standards.

**Product Water Storage**
Once the desalination process is complete, the water moves to storage tanks before being pumped to local water purveyors and blended with the regional water supply.

**Chemical Storage and Handling Facilities**
A wide range of chemicals are used extensively in the desalination and water treatment business (Williams, 2016). Substances used typically falling into one of two main groups. The first group, known as ‘online’ chemicals, includes coagulants, flocculants, chlorination and de-chlorination agents and biocides. The second group, often called ‘offline’ chemicals, includes a large number of somewhat stronger chemicals that can be used for a variety of purposes such as dissolving the fouling that attaches to filtration membranes during operation.

Typically, various chemicals associated with the desalination process are stored on site. Some
commonly stored chemicals include sodium hypochlorite, sodium hydroxide, sodium tripolyphosphate, sodium dodecylbenzene ammonia, lime, ferric sulfate, citric acid, and sulfuric acid. Chemicals must be stored in accordance with Federal, State, and local standards.

**Concentrate Management**
High levels of Total Dissolved Solids (TDS) concentrates (>65,000 mg/L) are produced by RO plants, which may also contain some toxic chemicals used during feedwater pretreatment and post-treatment. The concentrate from desalination (often referred to as brine) varies in composition and volume depending upon the nature of the source water. This makes Concentrate Management necessary to prevent significant environmental impact. Selection of management strategies depends on several factors: the concentrate volume and quality, the location of the desalination plant, and the pertinent environmental regulations. The following paragraphs explore examples of concentrate management practices often used, along with the benefits and drawbacks of each, then give recommendations based on the site specifics. The most used options are surface water discharge, submerged disposal, sewer disposal, deep well injection, land application, evaporation pools, and zeroliquid discharge (Hanley, 2018).

**Surface Water Discharge.** This method involves disposing the concentrate in waterways adjacent to the plant including tidal rivers and streams, oceans, estuaries, or bays. Environmental concerns include long-term effects on the water quality of coastal aquifers and adverse impacts on the receiving waters’ ecosystems.

**Submerged Disposal.** In this method the concentrate is transported away from the desalination plant via underwater pipes to an estuarine and/or ocean location. Environmental concerns include potential impact of sinking briny concentrate on benthic marine organisms living on the sea bottom.

**Deep Well Injection.** Deep well injections greatly depend on the geological setting. For example, a porous layer and aquifer would be required near the site. Additionally, construction of deep injection wells can be costly. Depths vary among areas on how deep the well would need to go. An EPA permit is required to verify the well would be stable for injection. Lastly, groundwater quality could be impacted due to injection.

**Sewer Disposal.** Sewer disposal is a relatively inexpensive and straight forward disposal option. The liquid waste would be sent to a treatment plant used by the area. Options with this include concentrate discharge to the front or the back of the wastewater treatment plant. Discharge to the front is not recommended as conventional wastewater treatments do not remove TDS, which can result in significant impact on the biological treatment process of the wastewater. Discharge disposal to the end of the wastewater treatment plant mixes with the treated wastewater, resulting in a diluted concentrate. Drawbacks to this option include the cost of constructing an additional pipeline (and possibly a pump) connecting the two separate plants, as well as the possibility of adversely impacting receiving water despite the dilution. This may be a viable option for concentration disposal, as the Santa Maria Wastewater Facility is nearby, directly 12.5 driving miles southwest of the proposed project site. Additional research into the impact of this process...
on receiving water is recommended. Correspondence with the wastewater treatment plant would also be needed to be assessed if the plant has the ability to integrate with the desalination plant.

**Evaporation Ponds** are another option, constructed with liners and allow water evaporation while the salts accumulate at the bottom of the pond. These ponds are cost effective and demand low energy input, but are best suited for arid regions, as moist air will decrease evaporation rates. The main problems with evaporation ponds is the large area needed to hold the substantial volumes of liquid. The ponds must be at a shallow depth to allow for evaporation, causing small volumes to be held even when using large areas. In recent years, technology has been developed to decrease the land area needed for ponds, which may be explored for the project site. Monitoring is essential for this process due to the exposure to wildlife. There is also a risk of groundwater contamination due to pool leakage.

**Land Application.** This method involves application of the concentrate to salt-tolerant crops or vegetation. Feasibility of this method depends on the local climate, land availability, location of the groundwater table, and vegetation tolerance to salinity.

**Brine Concentrators.** Technologies such as brine concentrators are relatively new but promise large scale minimization in brine discharge volumes by extending the range of RO filtering membranes to that of thermal evaporation. This process uses heat exchangers, deaerators, and vapor compressors to convert the traditional liquid concentrate produced to a more slurry, concentrated form. With this technology, brines can be concentrated up to 130,000 mg/L, which minimizes the total amount of brine being sent out for disposal. Downsides to this method including locating a disposal site for high concentrates of salts, ions, and chemicals and increased energy requirements to accomplish this methodology.

**Zero liquid discharge.** The zero liquid discharge method is another fairly new technology that employs an evaporation process to turn brine into a dry solid. This process would not be best suited for this project because it is extremely energy intensive, expensive, and pairs the best with thermal desalination technologies, not reverse osmosis.

The environmental constraints analysis section below will focus on the **submerged disposal** option for concentrate management. Reasons for this include:

- It is one of the most common methods in practice at other existing desalination plants
- Under the Desalination Amendment to the California Water Resources Control Board, if the toxicity levels in concentrated discharge are below recently established thresholds, submerged disposal would be considered acceptable with mitigation applied.

**Distribution**

The project will be designed to deliver freshwater for domestic consumption, landscaping, agricultural uses, and potentially ecological restoration of impaired local freshwater streams. The extent and location of distribution pipelines is unknown at this time and will not be included as part of the environmental constraints analysis.
2.6 Ecological Restoration Components

The following information came from (Yochum, 2018), (Doll et al., 2002), (Zander Associates, 2011), (U.S. Fish & Wildlife Service, 2020), (Parsons, 2020).

The ecosystems of the project site include coastal dunes, freshwater lakes, wetlands, and marshes. The ecosystems have similar threats from intensive recreation and invasive species. Restoration efforts will be directed towards improving the environmental and ecological condition of the degraded dune habitat and the degraded Little Oso Flaco Creek. The primary components of the ecological restoration phase are outlined in the paragraphs below.

Dune Habitat Restoration

Dune restoration typically begins with the removal of over-stabilizing invasive vegetation. In many cases, that action alone is sufficient to return the system to the point where native species can recolonize, and communities can recover. In other cases, more intensive intervention is needed. Often in these cases, fencing will accompany the planting of native species. Sand fences help promote effective dune formation. All dune restoration efforts will measure success with regular monitoring and maintenance.

Little Oso Flaco Creek Restoration

The USDA Guidance for Stream Restoration lists nine steps for a successful a restoration effort.

1. Identify problems and opportunities
2. Determine overall goals and specific objectives
3. Inventory resources
4. Analyze resource data
5. Formulate alternatives
6. Evaluate alternatives
7. Make decisions
8. Implement the plan
9. Evaluate the plan

There are numerous strategies for effective stream restoration. Different methods are useful for remedying different issues. In the case of Little Oso Flaco Creek, a study from the Coastal San Luis Resource Conservation District recommended biofiltration methods appropriate for farming activities and soil types. These methods include:

Filter Strips. A filter strip is an area of grass or other permanent vegetation used to reduce sediment, organics, nutrients, pesticides, and other contaminants from runoff and to maintain or improve water quality.

Vegetated Waterways. A vegetated waterway is a constructed channel that is shaped or graded to the required dimensions and established in suitable vegetation for the stable conveyance of runoff. It conveys runoff without causing erosion or flooding and improves water quality.
**Vegetated Retention Ponds and Basins.** Vegetated retention ponds and basins are meant to collect stormwater and slowly release it at a controlled rate so that downstream areas are not flooded or eroded.

### 3. Stakeholder Analysis

Stakeholders are individuals or parties that have an interest in the outcome of an organization’s actions. Examples of stakeholders include but are not limited to land management agencies, regulatory agencies, private landowners, business/industry groups, technical experts, and key community groups. Furthermore, stakeholders can be divided into three categories: internal, external, and key stakeholders. Internal stakeholders are the people and groups within the organization that is proposing an action, and in this report the Central Coast Economic Recovery Initiative are the main clients. External stakeholders are those that are impacted by the organization’s action. Finally, key stakeholders are those that are significantly affected by an organization’s action or have a high influence on the outcome. Regarding the stakeholder analysis, Table 1 outlines the stakeholders interested in the proposed creation of a desalination plant in place of the Phillips 66 Santa Maria Refinery. The interests of each stakeholder, as well as their role and contribution to the creation of a desalination plant are all listed. The order of the table is based on the stakeholder classifications.

*Table 2: The interests and roles of key stakeholders deciding the future of the Phillips 66 Santa Maria Refinery in San Luis Obispo County, California.*

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Area of Interest/Mission Statement</th>
<th>Role/Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Coast Economic Recovery Initiative</td>
<td>“The purpose of the ERI is to provide a process for advancing specific project, program, and policy ideas utilizing strategic partnerships throughout the Central Coast region, as well as provide a mechanism for ongoing community participation in local economic recovery efforts” (Paulding, Severance, &amp; Veium, 2021).</td>
<td>Internal Stakeholder/Main client</td>
</tr>
<tr>
<td>Cal Poly Institute for Climate Leadership and Resilience</td>
<td>Environmental protection and increasing the available freshwater supply</td>
<td>Internal Stakeholder</td>
</tr>
<tr>
<td>Oceano Economic Development Council</td>
<td>&quot;Identify and assess possibilities for Oceano’s equitable economic development and growth and, depending on the wishes of the community’s residents, obtain approval from the San Luis Obispo Board of Supervisors on Oceano’s redevelopment as a beach community” (Hunt, 2021)</td>
<td>Internal Stakeholder</td>
</tr>
<tr>
<td>People For the Dunes (coalition)</td>
<td>&quot;People for the Dunes is a community-focused campaign funded by donations from residents,</td>
<td>Potential Key or Internal Stakeholder</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Description</td>
<td>Role</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>------</td>
</tr>
<tr>
<td>EcoSlo (coalition)</td>
<td>&quot;ECOSLO strives to support and create resilient, healthy natural systems and life styles in San Luis Obispo County. We are committed to a sustainable future while working to improve our quality of life and economic vitality in our communities. Through education, advocacy, and community building, ECOSLO acts to protect the natural environment and environmental health on the Central Coast. It also supports renewable energy, energy conservation and efficiency, sustainable agriculture, green building and the local economy to promote sustainable economic development, protection of agricultural lands and open space, social equity, environmental justice and protection of our natural environment&quot; (VolunteerMatch, 2021)</td>
<td>Potential Key or Internal Stakeholder</td>
</tr>
<tr>
<td>County of San Luis Obispo</td>
<td>Serve the needs of the citizens in San Luis Obispo County</td>
<td>Key Stakeholder</td>
</tr>
<tr>
<td>San Luis Obispo County Department of Planning and Building</td>
<td>Maintain the wise use of land and build safe communities (County of San Luis Obispo, 2021)</td>
<td>Key Stakeholder &amp; Responsible Agency</td>
</tr>
<tr>
<td>California Coastal Commission</td>
<td>“The Commission is committed to protecting and enhancing California’s coast and ocean for present and future generations. It does so through careful planning and regulation of environmentally-sustainable development, rigorous use of science, strong public participation, education, and effective intergovernmental coordination” (Ainsworth, Christie, &amp; Selvaraj, 2017)</td>
<td>Key Stakeholder &amp; Responsible Agency</td>
</tr>
<tr>
<td>California Department of Fish and Wildlife</td>
<td>“The Mission of the Department of Fish and Wildlife is to manage California’s diverse fish, wildlife, and plant resources, and the habitats</td>
<td>Key Stakeholder &amp; Responsible Agency</td>
</tr>
<tr>
<td><strong>Environmental Constraints Analysis</strong></td>
<td><strong>Grey Pine Consulting</strong></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-------------------------</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Key Stakeholder &amp; Responsible Agency</strong></th>
<th><strong>California Regional Water Control Board</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Receive a Monitoring and Reporting Program from future site owners, and setting the water discharge requirements.</strong> (California State Water Resources Control Board, 2015)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Key Stakeholder &amp; Responsible Agency</strong></th>
<th><strong>State Parks</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>**To preserve, enhance, and restore the quality of California’s water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations” (California State Water Resources Control Board, 2019) **</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Key Stakeholder &amp; Responsible Agency</strong></th>
<th><strong>Oceano Advisory Council (City Council)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The purpose of the Oceano Advisory Council is to:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>• Promote community involvement to encourage sound planning and development in Oceano.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>• Provide education and public awareness of planning and community development issues.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>• Serve as liaison between Oceano and the County Board of Supervisors.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>• Advise on matters pertaining to development including but not restricted to land uses, public services, circulation, public improvements, and other orderly community growth, based on documents or specific plans which the community has adopted.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>• Hold public meetings, conduct studies and submit comments on how current and future projects may affect the Oceano community. The OAC</strong></td>
<td></td>
</tr>
</tbody>
</table>
4. Environmental Constraints Analysis

The following section will introduce four different resources issue areas which Grey Pine Consulting is focusing on. It includes an in-depth look at aesthetic, biological, geological, and recreational resources. With each issue area comes a description summarizing the site’s existing conditions and resources. Additionally, a series of threshold criteria derived from California Environmental Quality Act (CEQA) Appendix G is included to examine whether there may be a potential for significant impacts to any of the forementioned resources. If there is any potential for resources to be negatively impacted by the Nipomo Mesa Desalination Plant Project (NMDPP), Grey Pine Consulting will offer recommendations to avoid or minimize impacts to the respective resource.

4.1 Methodology

Due to the COVID-19 pandemic and other circumstances, Grey Pine Consulting conducted this Environmental Constraints Analysis (ECA) in a virtual format. This means that there were no onsite surveys taken. Instead, a multitude of literature reviews, online resources, and publicly available documents were used to gather pertinent information for the analysis. Specifically, much of the information provided in this ECA is derived from researching several Environmental...
Impact Reports (EIR) from similar desalination plant projects, local San Luis Obispo County projects, and previous Phillips 66 projects. Furthermore, additional project guidelines were established based upon the clients' goals and recommendations specified in an email chain between Sarah Spann and representatives from the Central Coast Economic Recovery Initiative, Cal Poly Institute for Climate Leadership and Resilience, and Oceano Economic Development Council. The various resource areas considered within the constraints analysis were drawn from the CEQA Appendix G questions. Geographic Information System (GIS) maps were generated by Grey Pine Consulting using map Areas of Interest (AOI) acquired from the client email chain to create relevant shapefiles of the project site boundary and other pertinent content.

4.2 Aesthetics

4.2.1 Issue Area Description

Current Visual Character
Currently, the character of the area immediately surrounding the Santa Maria Refinery is characterized by relatively flat land occupied primarily by agricultural land, industrial-use area, and residential area. Directly to the west of the refinery facilities are sprawling coastal sand dunes that continue for over 2 miles before meeting the Pacific Ocean. Adjacent to the project site, the industrial-use areas are largely composed of automobile wrecking and storage. Also in the immediate vicinity is California’s Highway 1. This specific portion of Highway 1 does not attract much tourism though, especially when compared to other areas of Highway 1, such as the stretch running through Big Sur. Generally, this location can be considered rural as it is not densely populated nor situated in a large town or city.

Existing Visual Conditions
The Phillips 66 property is visible to neighboring areas, but the existing refinery facilities are especially visible as they are a focal point on the property given that said facilities are congregated together on an otherwise bare parcel of land. Additionally, there is no form of wall or visual barrier, other than slight natural changes in elevation, on or within the property boundaries that block the public view of these facilities.

There are various locations and communities that may have sight of the current refinery or any potential future development on the site, such as the proposed desalination plant. These locations include both public and private views and range from roadways to golf courses. Grey Pine Consulting has identified some Key Viewing Areas, or KVAs, that are referenced in the map below.
Residential/Private Views
As indicated on the map, KVAs with views of the project site include the Monarch Dunes Golf Club and Blacklake Golf Resort, both of which also have hundreds of private residences on site. Not included in the map above as KVAs (but still potentially have views of the project site) are the private residences located on Mondanella Street, Luke Way, Raptor Street, and Laurie Way. This residential area/community is located immediately to the north of the project site and has a south-facing orientation to the Santa Maria Refinery facilities.

Scenic Vistas
The scenic vistas or areas in which Grey Pine Consulting identified as a KVA near the project site are Kathleen’s Canyon Overlook and Lower Black Lake Park. These areas are open for public use and recreation and may have views of the project site. Not specifically pointed out on the map but important to mention are the scenic vistas within the Oceano Dunes, which are of course accessible for varying public recreation. Due to the elevation changes and vastness of the Oceano Dunes, views of the project site may be restricted to certain areas within the Oceano Dunes.
Highways/Scenic Roadways
California’s Highway 1 briefly borders the property to the north, and again to the east, as pictured in the figures below. Highway 1, often referred to as the Pacific Coast Highway (PCH), runs from San Francisco all the way down to San Diego and is known for having beautiful views of California’s diverse landscapes. The PCH itself attracts global tourism, and in some parts of California is the primary highway for transportation, however the segment of Highway 1 that runs through the Nipomo Mesa is not frequented to nearly the same degree as say Big Sur, Santa Cruz, or Malibu.

While CA Highway 1 does surround the project site, there are no designate California State Scenic Highways present in the area (Caltrans, n.d.). Due to the lack of scenic roadways, the proposed project poses no potential impact to said scenic roadways and will not be addressed in the subsequent Potential Environmental Constraints section.

Light and Glare
Due to the semirural nature of the area surrounding the project site, the night sky has relatively low levels of light pollution. However, the Santa Maria Refinery and current project site utilizes light sources that remain on throughout the night, which produces a higher amount of light pollution than the surrounding area. The night sky brightness at the project sight is comparable to the night sky brightness of the cities of San Luis Obispo or Santa Maria.

Night sky brightness can be measured using the Bortle scale which uses units of magnitude/arcsecond². The scale ranges from 22.0 mag/arcsec², being the lowest level of sky brightness and is categorized as an excellent dark sky site, to 18.38 mag/arcsec² (or any value lower), being the highest level of sky brightness and is categorized as city/inner-city sky (Wikipedia contributors, 2021). According to data from 2015, the project site has a sky brightness of 20.44 mag/arcsec² (Light Pollution Map, 2015), thus falling under the Bortle scale category of suburban sky despite the area being more of a rural/suburban transition area. Typically, areas under the suburban sky category have visible light pollution in most directions.

4.2.2 Potential Environmental Constraints and Recommendations

Would the project have a substantial adverse effect on a scenic vista?

Impact Statement:
The necessary desalination facilities constructed for the Nipomo Mesa Desalination Plant would increase the visibility of the site from scenic vistas and key viewing areas.

Avoidance Measure #1 (AM AES-1):
To prevent or minimize impact to scenic vistas and key viewpoints of the desalination plant, the Nipomo Mesa Desalination Plant facilities would need to be built on the same section of the land parcel where the existing Santa Maria Refinery facilities are located currently. The facilities should also avoid exceeding the height of the Santa Maria Refinery facilities.

Avoidance Measure #2 (AM AES/REC-2):
To prevent or minimize impact to scenic vistas and key viewpoints of the desalination plant, any desalination intake and outtake pipes going to and from the Pacific Ocean would need to be built underground as opposed to above-ground.

The Santa Maria Refinery is currently visible from various scenic vistas and key viewing areas, as discussed in the previous section. Viewpoints of the site include Kathleen’s Canyon Overlook, Lower Black Lake Park, Oceano Dunes, Monarch Dunes Golf Club, and Blacklake Golf Resort. These locations have a view of the Phillips 66 Property, but the existing Santa Maria Refinery facilities are limited to a smaller, concentrated section of the entire Phillips 66 property (an approximately 200-acre footprint within the 1,780-acre property).

Because the proposed project would be built in place of the existing Santa Maria Refinery facilities, the potential construction and implementation of the Nipomo Mesa Desalination Plant does not necessarily have to inflict a negative and/or drastic change to scenic vistas and other key viewing areas. The level of impact will ultimately depend on factors such as the design and
size of the proposed desalination plant project, which are outside the scope of this Environmental Constraints Analysis.

**Recommendations:**
As mentioned above, design aspects of the Nipomo Mesa Desalination Plant are not included in the scope of this Environmental Constraints Analysis and are not by any means a specialty of Grey Pine Consulting. Grey Pine Consulting, however, can offer recommendations for the proposed project in regard to avoiding and/or minimizing visual impacts to aesthetic resources.

To maintain a similar or improved integrity of the visual resources surrounding the project site, impact to public and private views must be considered. The first avoidance measure (AM AES-1) Grey Pine Consulting suggests is to ensure that the Nipomo Mesa Desalination Plant facilities are constructed solely on the footprint of the existing oil refinery facilities. Not only should the footprint of the facilities remain the same or smaller, but the height of the desalination facilities and buildings should not exceed the height of the SMR facilities. In doing so, this prevents the expansion and visibility of the project site from the key viewing areas.

Additionally, avoidance measure AM AES/REC-2 recommends that the Nipomo Mesa Desalination Plant consider designing and constructing the intake and outtake pipes to be located below ground and underneath the Oceano Dunes to avoid being visible from dune recreation areas.

**Would the project create a source of substantial light or glare that would adversely affect day or nighttime views in the area?**

<table>
<thead>
<tr>
<th>Impact Statement:</th>
<th>The lighting needed for the Nipomo Mesa Desalination Plant Project would adversely affect nighttime views in the area.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avoidance Measure #1 (AM AES-3):</strong></td>
<td>To minimize creating night sky light pollution, the Nipomo Mesa Desalination Plant would need to limit on-site lighting structures and sources of light as much as possible.</td>
</tr>
<tr>
<td><strong>Avoidance Measure #2 (AM AES-4):</strong></td>
<td>To avoid adversely affecting nighttime views in the area, the Nipomo Mesa Desalination Plant would need to implement dark sky compliant lights.</td>
</tr>
<tr>
<td><strong>Avoidance Measure #3 (AM AES-5):</strong></td>
<td>To avoid creating a source of glare to daytime and/or nighttime views, the Nipomo Mesa Desalination Plant would need to purposefully angle any on-site lighting downwards and away from roadways.</td>
</tr>
</tbody>
</table>

Currently, the Santa Maria Refinery’s on-site lighting is kept on throughout the night, thus creating higher levels of light pollution than the surrounding area. The refinery facilities produce a night sky brightness of 20.44 mag/arcsec² (Light Pollution Map, 2015). While the project site is
located in a semi-rural area, the night sky brightness at the project site is comparable to the night sky brightness produced by the cities of San Luis Obispo and Santa Maria. If the Nipomo Mesa Desalination Plant Project were to be seen through, it would be favorable to reduce the light pollution from current levels.

Important to note, the night sky brightness measurements referenced above are from 2015 data. It is in the interest of the project applicant to pursue current and post-construction studies/measurements of the night sky brightness levels at the project site.

**Recommendations:**
Grey Pine Consulting has determined some recommendations to avoid creating sources of substantial light and glare that would adversely affect day or nighttime views in the area. Avoidance measure AM AES-3 suggests that the Nipomo Mesa Desalination Plant limit on-site lighting structures (for example, light posts lining the project site) and sources of light (such as light that comes from inside buildings and facilities via windows or openings). Specifically, the goal of this avoidance measure is to limit nighttime light pollution.

AM AES-4 recommends that the Nipomo Mesa Desalination Plant consider using lights that are dark sky friendly. Dark sky compliant lights are designed to minimize glare and skyglow through their design and color of light. Typically, dark sky friendly lights limit blue-light and give off more of a yellow/orange hue.

To avoid creating sources of glare to daytime and nighttime views, Grey Pine Consulting recommends AM AES-5, which suggests that the lighting constructed for the proposed project be intentionally oriented downwards and away from roadways. Another possibility to consider, in regard to the angle of lighting, is to implement shielded lights in addition to pointing lighting downwards and/or away from the surrounding area.

**4.3 Biology**

**4.3.1 Issue Area Description**

**Existing Environmental Setting**
The project site is surrounded by various habitats that are inhabited by species of concern. The information is based on data from the United States Fish and Wildlife Service’s Environmental Conservation Online System (ECOS) and the Habitat Conservation Plan (HCP) for the Oceano Dunes District Draft EIR.

**Physical Setting**
The area has year-round mild temperatures, dry summers, and moist winters. Mild temperatures are caused by the Pacific Ocean, which is in close proximity to the project site. As the site is close to the Pacific Ocean, the elevation around the project site is between 200 feet and 0 feet above sea level. Although the topography is flat by the coast, the dunes vary the topography more significantly inland. Wind typically comes from the west and northwest, making the slopes of the dunes steeper on the eastern side and flatter on the coastal side. The location of the refinery
Environmental Constraints Analysis

Grey Pine Consulting

is in the Guadalupe-Nipomo Dunes Complex, which is a relatively intact coastal dune and dune scrub ecosystem. The project is in two watersheds, the Arroyo Grande Creek watershed to the north and the Oso Flaco Creek watershed to the south (MRS, 2014).

Environmentally Sensitive Habitat Areas (ESHA)
Before developing in the coastal zone, there must be considerations for ESHA. A coastal zone declares a site as ESHA usually when there are rare species present, which are plants and animals that are classified by the CDFW. The restrictions for development in ESHA are defined by the Coastal Act, specifically sections 30107.5, 30121, and 30233. Be sure to accurately identify, map, and assess the underlying habitat types potentially affected by a project before submitting a proposal for a Coastal Development Permit (Caltrans, 2016). Figure 12 visualizes the ESHA within and surrounding the proposed project site.

![Figure 12: The ESHA designations near the project site located in San Luis Obispo County, CA. Exact project site boundaries are not depicted. Map created by the County of San Luis Obispo.](image)

Habitat Types:

**Marine Ecosystems**
In 1976, the California Coastal Act was passed to ensure the long-term protection of the state’s coastal resources. The Act's coastal resource management law is based on the California Coastal
Plan's recommendations. This code enumerates policies in an effort to protect, preserve and conserve local marine ecosystems. Specifically, the California Coastal Act ensures that environmentally sensitive habitats, such as intertidal and nearshore waters, wetlands, bays and estuaries, riparian habitat, some forests and grasslands, streams, lakes, and habitat for rare or endangered plants and animals, are all protected, enhanced, or restored. Coastal and marine ecosystem elements that are important to protect on site include the local dunes, water quality potentially affected by site runoff or pipeline discharge, and the critical habitat for listed endangered species (MRS, 2014).

**Wetlands**
Wetlands are defined by the federal government as those areas “that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (US EPA, 2019).” There are 3 lakes surrounding the project site: (Little) Oso Flaco Lake to the southwest, Lettuce Lake to the west, and Jack Lake to the west. (Little) Oso Flaco Lake is connected to Oso Flaco Creek on the east but is separate from the main Oso Flaco Lake on the west. Figure 10, the Wetlands Map constructed through the U.S. Fish and Wildlife Service Wetlands Mapper Tool, depicts the wetlands that occupy the project site and the surrounding area. Compared to the greater area, there is a minimal number of wetlands that are within the vicinity of the project site (US Fish and Wildlife Service, n.d.).

**Barren/Dunes**
The project site is on dunes that have been modified for industrial production. These dunes provide habitat for species such as the endangered snowy plover. About a quarter of the property is covered in dunes. Specifically, the western portion of the west site and the southwestern portion of the east site is filled with dune habitat (Service, n.d.).
Vegetation Alliances

19 vegetation classifications are contained and surrounded by the project site, as depicted in figure 8. The western portion of the site is dominated by coastal scrub, annual grassland, and barren fields. There is urban development on the eastern portion of the site in addition to the three vegetation alliances on the west. The vegetation is occupied by both native and nonnative species. Some native species include the live oak coastal scrub, which is valuable to the state of California. The nonnative counterparts, such as the eucalyptus groves, are of lesser importance. However, the nonnative vegetation provides habitat for species. All of this data was provided by the State of California and the Department of Forestry and Fire Protection.
Figure 14: Current Vegetation classifications near or around the project site in San Luis Obispo County, CA.

Special Status Species

Endangered species are classified by the U.S. Fish & Wildlife Service and are protected under the Federal Endangered Species Act. Many threatened and endangered species inhabit the critical habitats surrounding the existing project site. Table 2 lists the endangered and threatened animal species, while table 3 lists the endangered and threatened plant species. These species occupy different portions of the project site, and the critical habitat is noted (U.S. Fish and Wildlife Service, 2016).

Table 3: Animal species of concern present in and around the site of the Phillips 66 Santa Maria Refinery in San Luis Obispo County, CA.

<table>
<thead>
<tr>
<th>Species</th>
<th>Designation</th>
<th>Habitat composition/critical habitat/primary location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blunt-nosed Leopard Lizard</td>
<td>Endangered</td>
<td>None</td>
</tr>
<tr>
<td>California Clapper Rail</td>
<td>Endangered</td>
<td>None</td>
</tr>
<tr>
<td>Species</td>
<td>Designation</td>
<td>Habitat composition/critical habitat/primary location</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-------------</td>
<td>----------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>California Condor</td>
<td>Endangered</td>
<td>Designated critical habitat, location not available</td>
</tr>
<tr>
<td>California Least Hern</td>
<td>Endangered</td>
<td>None</td>
</tr>
<tr>
<td>California Red-Legged Frog</td>
<td>Threatened</td>
<td>Coastal Drainages</td>
</tr>
<tr>
<td>California Tiger Salamander</td>
<td>Threatened</td>
<td>Designated critical habitat, location not available.</td>
</tr>
<tr>
<td>Giant Kangaroo Rat</td>
<td>Endangered</td>
<td>None</td>
</tr>
<tr>
<td>Kern Primrose Sphinx Moth</td>
<td>Threatened</td>
<td>Proposed critical habitat, location not available.</td>
</tr>
<tr>
<td>Least Bell’s Vireo</td>
<td>Endangered</td>
<td>Designated critical habitat, location not available</td>
</tr>
<tr>
<td>Marbled Murrelet</td>
<td>Threatened</td>
<td>Designated critical habitat, location not available, Seabird</td>
</tr>
<tr>
<td>Southwestern Willow Flycatcher</td>
<td>Endangered</td>
<td>Designated critical habitat, location not available</td>
</tr>
<tr>
<td>Tidewater Goby</td>
<td>Endangered</td>
<td>SLO 12 - Oso Flaco Lake</td>
</tr>
<tr>
<td>Vernal Pool Fairy Shrimp</td>
<td>Threatened</td>
<td>Designated critical habitat, location not available. Vernal pools, seasonal wetlands</td>
</tr>
<tr>
<td>Western Snowy Plover</td>
<td>Threatened</td>
<td>Designated critical habitat, location not available. Sand beaches, salt flats and dunes</td>
</tr>
</tbody>
</table>

Table 4: Plant species of concern present in and around the site of the Phillips 66 Santa Maria Refinery in San Luis Obispo County, CA.

<table>
<thead>
<tr>
<th>Species</th>
<th>Designation</th>
<th>Habitat composition/critical habitat/primary location</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Jewelflower</td>
<td>Endangered</td>
<td>None</td>
</tr>
<tr>
<td>Gambel’s Watercress</td>
<td>Endangered</td>
<td>None</td>
</tr>
<tr>
<td>La Graciosa Thistle</td>
<td>Endangered</td>
<td>Designated critical habitat overlaps with site. Total designated critical habitat is over 24,000 acres in San Luis Obispo and Santa Barbara counties</td>
</tr>
<tr>
<td>Marsh Sandwort</td>
<td>Endangered</td>
<td>None</td>
</tr>
<tr>
<td>Nipomo Mesa Lupine</td>
<td>Endangered</td>
<td>None</td>
</tr>
<tr>
<td>Pismo Clarkia</td>
<td>Endangered</td>
<td>None</td>
</tr>
<tr>
<td>Salt Marsh Bird’s-beak</td>
<td>Endangered</td>
<td>None</td>
</tr>
<tr>
<td>Spreading Navarretia</td>
<td>Threatened</td>
<td>Designated critical habitat, location not available.</td>
</tr>
</tbody>
</table>

Migratory Birds
The SMR site lies within the path of multiple migratory birds. Their temporary habitat within this site is protected through the Migratory Bird Treaty act. Migratory birds within the site are enumerated as such: Allen’s Hummingbird, Bald Eagle, Black Oystercatcher, Black Skimmer, Black Swift, Black Turnstone, Clark’s Grebe, Common Yellowthroat, Golden Eagle, Lawrence’s Goldfinch, Long-billed Curlew, Marbled Godwit, Mountain Plover, Nuttall’s Woodpecker, Oak

4.3.2 Potential Environmental Constraints and Recommendations

Would the proposed project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Impact Statement:
The proposed Nipomo Mesa Desalination Plant Project would not significantly impact local or regional species identified as a candidate, sensitive, or special status species, as defined by the U.S. Fish and Wildlife Service, the California Department of Fish and Game and other local agencies. Any potential effects of the construction or use of the site will be mitigated to below levels of significance through the following avoidance measures.

Avoidance Measure #1 (AM BIO-1):
To avoid the above impact, the applicant would need to develop and execute a Biological Mitigation and Monitoring Plan that defines construction and operational avoidance, reduction, and mitigation strategies for impacts to vulnerable natural species. Best Management Practices (BMPs) must be included in the Biological Mitigation and Monitoring Plan in order to prevent or reduce impacts on species identified as a candidate, sensitive, or special status species.

Avoidance Measure #2 (AM BIO-2):
To avoid the above impact, the applicant would need to retain a qualified Environmental Coordinator/qualified biologist to oversee compliance with the Biological Mitigation and Monitoring Plan, subject to the City’s review and approval. The Applicant’s Environmental Coordinator is responsible for monitoring all construction activities and reporting to San Luis Obispo County offices on construction activities, compliance concerns, and remedial actions on a quarterly basis. Every workday, the Applicant's Environmental Coordinator is responsible for inspecting the work area to ensure that development areas and vulnerable or preserved habitats are free of construction-related impacts or dangers to wildlife.

There are a variety of different special interest species in and around the Nipomo Mesa Desalination Plant Project site, who need to be protected and retain their habitat. The impacts on their habitat due to site construction, operation and restoration will be less than significant. The threshold of significance will not be met due to AM Bio-1-2. These avoidance measures will be effective for protecting the sensitive species in the construction and operational phases of the proposed project.

Recommendations:
Grey Pine consulting recommends that both AM BIO-1 and AM BIO-2 be taken in order to minimize the significance of the construction, operation and conservation phases of the
project. There are numerous special interest species and their habitats on and around the site. The construction and operation phases have the potential to emit a significant number of pollutants and toxins into the air and groundwater. Through these avoidance measures, sufficient monitoring, oversight and management practices will potentially lower the impact of the project to below levels of significance, as per CEQA Appendix G Guidelines.

Would the proposed project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

Impact Statement:
The proposed Nipomo Mesa Desalination Plant Project would not significantly impact local or regional riparian habitats or other sensitive natural communities as defined by the U.S. Fish and Wildlife Service, the California Department of Fish and Game and other local agencies. Any potential effects of the construction or use of the site will be mitigated to below levels of significance through the following avoidance measures.

Avoidance Measure #1 (AM BIO-3):
Permanent impacts that result in the destruction of streambed, wetland, or riparian vegetation must be mitigated at a 2:1 ratio (acreage of riparian corridor retained and enhanced: acreage of riparian corridor impacted) and must include replacement plantings to compensate for the loss of native trees and shrubs from the project site. At a 1:1 ratio, temporary impacts of the project must be restored. To avoid the above impact, the applicant would need a program Aquatic Resource Mitigation and Monitoring Plan that specifies no net loss in acreage or function must define the design, monitoring schedule, and success criteria for mitigation planting.

Per CEQA Appendix G guidelines, the proposed project should not significantly impact local or regional riparian habitats or other sensitive natural communities as defined by the U.S. Fish and Wildlife Service and other agencies. Any impacts on these riparian communities will be mitigated at a 2:1 ratio, so the acreage of communities impacted will be doubled and those other riparian areas will be protected. The threshold of significance will not be met because of avoidance measure AM BIO-3. The avoidance measures will protect the riparian areas during the construction and operational phases of the proposed project.

Recommendations:
Grey Pine consulting recommends that AM BIO-3 be taken in order to minimize the significance of the construction, operation and conservation phases of the project. There are a variety of sensitive natural communities, and riparian zones on and around the site. The construction and operation phases have the potential to emit a significant number of pollutants and toxins into the groundwater and other sources, damaging the existing setting. Through this avoidance measure, sufficient monitoring, oversight and management and conservation practices will potentially lower the impact of the project to below levels of significance, as per CEQA Appendix G Guidelines.
Would the proposed project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Impact Statement:
The proposed Nipomo Mesa Desalination Plant Project would not significantly impact local or regional federally protected wetlands, as defined by Section 404 of the Clean Water Act, through any means. Any potential effects of the construction or use of the site on federally protected wetlands will be mitigated to below levels of significance through the following avoidance measures.

Avoidance Measure #1 (AM BIO-4):
To the greatest extent possible, the Biological Mitigation and Monitoring Plan would include the avoidance of vulnerable natural communities and wetland areas. Mitigation for impacted vulnerable natural communities that cannot be avoided must be accomplished using one or more of the following options, which must be approved by the County of San Luis Obispo:

a) Where feasible onsite restoration options exist and at ratios consistent with those described in above mitigation measures, on-site restoration, development, or formation of suitable replacement habitat;

b) For sensitive natural communities, native grasslands, and riparian habitat, offsite restoration or development of suitable habitat at a minimum replacement ratio of 2:1 is mandated;

c) Monetary contribution to an in-lieu fee program that results in habitat enhancement or development for the affected natural communities and/or species; and/or

d) Purchase of mitigation credits from a mitigation bank that has been certified by the USFWS and/or the CDFW.

The project should not alter local or regional wetlands beyond the threshold of significance. Per AM BIO-4, a Biological Mitigation and Monitoring Plan will mitigate the impact on species that are certain to be affected. Specifically, the mitigation will incorporate onsite restoration during the construction phase of the project. Otherwise, offsite mitigation will occur and there will be monetary contributions to programs that protect habitats. The avoidance measures will protect habitat during the construction phase of the project, as impacts to wetlands will be minimal during the operational phase of the desalination plant.

Recommendations:
Grey Pine consulting recommends that AM BIO-4 be taken in order to minimize the significance of the construction, operation and conservation phases of the project. There are multiple wetlands on and around the site. The construction and operation phases have the potential to emit a significant number of pollutants and toxins into the groundwater and surrounding waters, damaging the existing wetlands setting. Through this avoidance measure, sufficient monitoring, oversight and management practices will potentially lower the impact of the project to below levels of significance, as per CEQA Appendix G Guidelines.
Would the proposed project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Impact Statement:
The proposed Nipomo Mesa Desalination Plant Project would not significantly impact the movement, migratory patterns or migratory corridors of any native resident or migratory fish or wildlife species with established native resident or migratory sites in this impact region. The project will also not significantly impede the use of native wildlife nursery sites. Any potential effects of the construction or use of the site will be mitigated to below levels of significance through the following avoidance measures.

Avoidance Measure #1 (AM BIO-5):
To avoid the above impact, the applicant would need to conduct a study examining the migratory patterns, timing and sites of all established native resident or migratory fish or wildlife species. Habitat infringement, through construction, the effects of construction, site use or any other element related to the project will be barred from these sensitive areas during each species’ migratory usage of the site. Any affected habitat will be remedied, restored or reconstructed nearby by the time the affected species returns to the site, corridor or migration path. Penalties could include Monetary contributions to an in-lieu fee program or requirements to purchase mitigation credits from an approved mitigation bank as per sections C&D within mitigation measure.

The project will not affect the migratory patterns of species of native residence, as indicated by the CEQA Appendix G guidelines. Impacts to migratory species will be avoided through the implementation of AM BIO-5, where future studies will examine the migratory patterns of species. If the project were to interfere with a species’ migratory patterns, then affected habitat will be remedied. These effects on migratory species will likely occur during the construction and operational phases, so mitigation should begin in the construction phase of the project. Once the construction phase of the project is completed, a final mitigation should occur to allow the migratory species to utilize their habitat any time during the operational phases of the desalination plant.

Recommendations:
Grey Pine Consulting recommends the implementation of AM BIO-5 to prevent substantial interference with the movement of migratory species during the construction and operational phases of the plant. The existing site conditions have not been determined, which is why a study is necessary for further action. However, if trees are removed during the site’s construction or operational phases, then migratory birds are expected to be impacted. One example of this is the Southwestern Willow Flycatcher, which travel south in the winter and inhabit the dense vegetation around riparian areas. By incorporating AM BIO-5 into the plans, the existing conditions at the site can be accommodated for and impacts to migratory species will be minimized.
Would the proposed project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Impact Statement:
The proposed Nipomo Mesa Desalination Plant Project would not significantly impact local or regional policies or ordinances protecting biological resources established by federal, state or local agencies and entities. Any potential conflicts created by the construction or use of the site will be mitigated to below levels of significance through the following avoidance measures.

Avoidance Measure #1 (AM BIO-6):
To avoid the above impact, the project would need to comply with Public Resources Code (PRC) Section 5090.35, which requires an inventory of wildlife populations in the dunes and a preparation of a Wildlife Habitat Protection Plan (WHPP). The goals of the WHPP are to conserve and improve existing wildlife habitats. If the WHPP is not being implemented, then the operations of the plant must cease activity until proper compliance with the WHPP.

The local policies that protect biological resources in the project vicinity are found in PRC Section 5090.35. To comply with PRC Section 5090.35, plant owners must create a WHPP that is effective in both the construction and operational phases of the desalination plant. Future studies will need to be conducted in order to create this WHPP for the project specific site, and then compliance with the plan will need to be executed during the operational and construction phases or else activities must halt.

Recommendations:
To comply with local policies and not exceed the thresholds of significance for changing existing conditions, Grey Pine Consulting recommends executing AM BIO-6. The existing conditions for this CEQA Appendix G question are null, as the specific policy that could be potentially violated is only requesting an inventory of wildlife populations. However, the existing conditions can still be violated after completing this inventory, which should be finished before the construction phase begins. If a species is present before the construction begins but is absent during the construction or operational phases of the desalination plant, then the goals of the WHPP are not met and there could be a potentially significant impact.

Would the proposed project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Impact Statement:
The proposed Nipomo Mesa Desalination Plant Project would not significantly impact local or regional Habitat Conservation Plans, Natural Community Conservation Plans or other approved federal, state, regional, or local habitat conservation plan. Any potential conflicts of plans caused by the construction or use of the site will be mitigated to below levels of significance through the following avoidance measures.
Avoidance measure #1 (AM BIO-7):
To avoid the above impact, the project would need to be in accordance with the Oceano Dunes HCP and account for the following four measures: CA-12b, CA-21, CA-50, and CA-52.
Unattended SNPL chicks and eggs will be collected and sent to captive rearing if at risk of injury or death; mechanical trash removal in heavily used areas; removal of fencing if found to benefit the local wildlife; implementation of drones or unmanned aircraft systems to reduce cost when collecting data.

The proposed project will not significantly impact the local Oceano Dunes Habitat Conservation Plan (HCP), per the CEQA Appendix G guidelines. Avoidance measure BIO-7 will be implemented throughout the construction and operational phases of the project so that no violations are made. Specifically, the plant managers will abide by measures CA-12b, CA-21, CA-50, and CA-52 to protect biological resources. These measures will reduce trash that can affect biological resources, remove fencing for greater corridor access, use aircraft systems that will protect migratory birds, and save individual snowy plovers that face potential death or injury.

Recommendations:
Implementation of AM BIO-7 will not conflict with the Oceano Dunes HCP, therefore Grey Pine Consulting recommends the implementation of this avoidance measure to not exceed the thresholds of significance. The existing Oceano Dunes HCP requests compliance with four measures, as discussed before. So long as these four measures are met, there should be no changes to the existing conditions and the impact as defined by the CEQA Appendix G guidelines will not be significant.

4.4 Geology and Soils
4.4.1 Issue Area Description
The Nipomo Mesa Desalination Project Site is located on the Oceano Dunes. These sand dunes have been formed and continue to be shaped and changed by the winds that come off the ocean and the seasonal spring winds. This buildup of coarse sand represents a unique landform as the coastal sand dune environment makes up only a fraction of all coastlines in the world. This sand will certainly bring about some limitations and opportunities for the project.
Figure 15: Map and corresponding legend illustrating sand content of project site soils, by percent. Located in San Luis Obispo County, CA.
Geology
The project site is located atop a 780 foot deep sequence of westward dipping unconsolidated sediment. The dune sand that the project site is comprised of is from the Holocene, which is the current geological time period. The greater region of Oceano is located in the Santa Maria Basin and the San Luis Range which extends to the Santa Ynez Mountains in Santa Barbara County. This forms the transition between the Coastal Ranges and the Transverse Ranges of California’s geological provinces (AECOM, 2020).

The project site is located west of where the major San Andreas Fault Line runs north to south. Additionally, the facilities will be located within the vicinity of multiple fault zones. The Hosgri fault zone lies approximately 15 miles north of the project site, the Los Alamos Fault lies approximately 30 miles to the southwest, and the San Luis Range Fault System lies roughly 1.5 miles east. Other fault lines within 100 miles of the project site include the Rinconda, Casmalia, Lions Head, and San Juan. The Rinconada and Hosgri faults have the highest maximum potential magnitude at 7.5 (Michael Brandman Associates, 2009). The California Earthquake Authority notes that there is a 75% chance of a 7.0 magnitude earthquake or higher occurring in a 30-year time span.

Additionally, this produces the potential for liquefaction when the undeveloped sandy soils are saturated, and an earthquake strikes. Liquefaction is when a saturated sandy soil acts like a liquid during an earthquake event, meaning that infrastructure built on the soils could potentially sink into the soil (United States Geological Survey). It is most likely to occur in loosely consolidated Holocene aged soils. It can cause potential damage to foundational structures and underground utility lines. In San Luis Obispo County, GIS modeling shows that liquefaction potential is highest where sandy beaches, dune soils, or Baywood soils occur (Lowman, 2009). The western parcels of the project site have a higher percentage of sand (greater than 95%) and show the highest potential for liquefaction due to their loose consolidation and geologically young age. In the 2003 San Simeon Earthquake, a lot of damage in Oceano occurred from liquefaction (Michael Brandman Associates, 2009).

San Luis Obispo County is also home to a uniquely high amount of Serpentineite rock. Serpentineite is a slippery and smooth light green metamorphic rock. It is a rare formation of rock, but surprisingly abundant in San Luis Obispo County. It is significant for multiple reasons. Serpentineite is currently the California state rock thanks to its aesthetics and abundance in our state. Thus, the rock has significant cultural value to the state of California. Additionally, Serpentineite contains the hazardous substance of asbestos and can be damaging to public health when weathered down to fine particles which is uncommon (State of California). Serpentineite is also an aid to biodiversity as it is low in nutrients and high in toxic chemicals to plants. This means that plants capable of growing in serpentine soils are highly adapted and unique. All these factors make serpentineite a significant geological resource of the area. There is no data that shows serpentineite outcrops or serpentine soils in the project site, thus, an on the ground evaluation must be done to fully evaluate its presence on the site.
Soils
With the strong winds that come off the ocean, the project site’s soils are a major health concern of the surrounding area. The sand gets blown off the landforms which finds its way into the local communities. This is perfectly normal for a sand dune landform, however, its vicinity to local communities makes this an issue. The Natural Resources Conservation Survey (NRCS) Web Soil Survey list the entire project site as in group one of eight on the wind erodibility index, one being the most susceptible and eight being the least (Natural Resources Conservation Service). Although these winds and sandy soils can lead to landscape turnover and dune shifting, the United States Geological Survey (USGS) indicates that there is no possibility of landslide on the project site and the surround dunes (United States Geological Survey).
Figure 16: Map and corresponding legend illustrating potential for soil erosion by wind, scaled by erodibility on project site located in San Luis Obispo County, CA. Erodibility ranges from 1 (highest) to 8 (lowest).
Additionally, a significant portion of the land is listed on the Web Soil Survey as moderate and high potential to steel corrosion and moderate potential to concrete corrosion. The concrete erosion listing is derived from the soils high content of sulfate and sodium along with a low pH and coarse texture. The moderate steel erosion listing is derived from the soil’s low pH, the high moisture contents in the soil, and a high electrical conductivity, which is effectively a high salt content in the soil profile (Natural Resources Conservation Service).

Another issue found within soils in the area is the presence of coccioiodes, or commonly known as Valley Fever. Valley Fever is a fungal disease that can result into severe flu-like symptoms and is frequently found throughout the southwestern United States, and especially in California. The fungus sits in the soil and can be triggered and sent into the air when the soil is disturbed by processes such as construction or excavation (San Luis Obispo County). The Web Soil Survey does not include information on the likelihood that Valley Fever exists on the project site (Natural Resources Conservation Service). However, concerns of Valley Fever in soils around the county make this a potential cause for concern and certainly needs more in-depth analysis.

This project site is also home to multiple blocks of land that qualify as hydric soils. Hydric soils are soils that are saturated with water year-round. This year-round moisture creates an anaerobic environment that works as habitat for unique hydrophytic vegetation, migratory birds, and performs ecosystem services such as water purification. Hydric soils are one of the key characteristics of a wetland which is a habitat where there is surface water year-round or nearly year-round that has anaerobic ecological activity (Natural Resources Conservation Service).

The site’s sandy soil texture is an issue with waste treatment and disposal. The Web Soil Survey lists most of the site as very limited to waste disposal by infiltration. This listing is derived from the fact that the coarse soils will allow the waste to percolate through the soil profile very rapidly. This can allow contaminants to seep so far into the ground that it contaminates the water table. This can clearly be an issue for municipal and agricultural water supplies in the area. This fast infiltration rate also makes the project site very limited to creating and maintaining septic waste infrastructure (Natural Resources Conservation Service).
Figure 17: Map and corresponding legend illustrating potential for rapid infiltration wastewater treatment on project site located in San Luis Obispo County, CA.
4.5.2 Potential Environmental Constraints and Recommendations

Would the project directly or indirectly cause potential substantial adverse effects including the risk of loss, injury, or death involving the rupture of a known earthquake fault?

**Impact Statement:**
If the proposed project decided to use deep well injection for disposal of the briny discharge, the planned project would have the potential to rupture the local San Luis Range Fault Line. However, the project intends to use submerged discharge to dispose of briny discharge, thus, there is insignificant potential for loss, injury, or death through the rupture of a fault.

The largest earthquake recorded caused by deep well injection measured 5.8 on the Richter scale (United States Geological Survey). This was abnormally large for an event caused by deep well injection. However, given California’s history of strong earthquakes, especially along the San Andreas Fault Line, infrastructural building codes require that buildings can withstand earthquakes much stronger than any caused by deep well injection along the San Luis Range Fault Line. The larger earthquakes that can lead to major damage would come from the San Andreas Fault Line of which the project would have no impact on as it lies a significant distance to the east of the project site. Although seismic activity caused by deep well injection is unlikely to be significant enough to cause damage, injury, or death, it is worth taking the time to ensure that the plant is up to code. Additionally, since the project is utilizing submerged disposal for the briny discharge, this issue is insignificant.

**Recommendations:**
As there is little to no possibility of significant impacts, Grey Pine Consulting has no recommendations to reduce impacts.

Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death, involving strong seismic activity?

**Impact Statement:**
The project site is located near multiple active fault zones, making the risk of seismic activity a potentially significant issue.

The closest active fault zones to the project site are the Hosgri, Oceano, Wilmar Avenue, and Orcutt-Casmilia faults. All of which have the potential to cause strong ground movement at the project site location. According to a seismic analysis conducted in 1990, there is a 10 percent chance that seismic activity could occur on the project site within the next 50 years (Michael Brandman Associates, 2009). Since California is known to have a plethora of strong and significant earthquakes, building code standards require that structures be able to withstand earthquakes of certain degrees. Thus, so long as the structures are up to local building codes, this should not be a grave concern to safety.
**Recommendations:**

There should be no significant impacts so long as uniform building codes are met. Therefore, Grey Pine Consulting has no recommendations to reduce impacts.


Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death, involving strong seismic-related ground failure including liquefaction?

**Impact Statement:**

Shallow depth to roots, shallow depth to the water table, and poorly consolidated sandy soils make the project site subject to liquefaction ground failure.

**Avoidance Measure #1 (AM GEO-2):**

In order to avoid or minimize the above impact, the project applicant would need to perform a liquefaction potential test.

Liquefaction occurs when saturated and loosely consolidated soils undergo a trigger such as an earthquake that causes structures to sink into the soil, almost as if it were liquid. This depends greatly on soil type, strength and duration of the trigger, and depth to the water table (United States Geological Survey). Low lying areas with poorly consolidated and saturated sediments are most at risk to liquefaction. With a shallow water table and loose sandy soils, this project site has the potential for liquefaction (Natural Resources Conservation Service). Should a trigger occur, the potential liquefaction could cause direct damage to structures and any people in them. It would also halt operations of the desalination facility.

**Recommendations:**

In order to mitigate this risk, a liquefaction potential test must be conducted. Liquefaction potential is heavily dependent on the relative density of the soil and the mean particle size of the sand. A geotechnical engineering firm can run a liquefaction potential test using soils from the project site to identify areas of particularly high risk of liquefaction and give mitigation measures to avoid dangers (Hakam et al, 2016). These tests utilize models and formulas that are highly complex that would be best outsourced to a professional firm that specializes in geotechnical and civil engineering. Based on the dangers observed by the engineers, they will be able to offer specialized mitigation measures such as an emergency response plan.


Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death, involving landslides?

**Impact Statement:** The low slopes and topography of the project site create no significant risk of loss or endangerment of human life due to landslides.
According to the USGS’s GIS database of potential locations for landslides, this proposed project site has no risk of landslides. Landslides occur when forces acting downward on the slope exceed the strength of the earth materials that create the slope. The downward forces that shift the land slope is mainly due to gravity, meaning that slopes must have a high degree of incline to be of risk to landslides. The project site is mostly composed of low-lying dune that rests at 0-9 percent slopes. Occasionally, slopes have the potential to reach 30 percent, but not a significant proportion of the project site. Therefore, there is no significant risk of landslide dangers on the project site.

**Recommendations:**
As there is little to no possibility of significant impacts, Grey Pine Consulting has no recommendations to reduce impacts.

**Would the project result in substantial soil erosion or the loss of topsoil?**

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<th>Impact Statement:</th>
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<tr>
<td>This project has the potential to exacerbate and create soil erosion as a result of construction and operation. The excavation of soils to build pipelines to the ocean will be especially significant.</td>
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<tr>
<th>Avoidance Measure #1 (AM GEO-3):</th>
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<tr>
<td>To avoid the above impact, the applicant would need to document and map new foundation to be laid on the project site.</td>
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<tr>
<th>Avoidance Measure #2 (AM GEO-4):</th>
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<tr>
<td>To avoid the above impact, the applicant would need to consult geological and soil consultants on the least destructive and invasive path to the ocean for discharge and intake pipelines.</td>
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<tr>
<th>Avoidance Measure #3 (AM GEO-5):</th>
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<tbody>
<tr>
<td>To avoid the above impact, the applicant would need to monitor sites for unusual and exacerbated rates of soil erosion.</td>
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Erosion is a key and natural process of the coastal dune environment. On less stable dunes, wind erosion and gravity change the topography constantly. The project site is located on the stabilized portion of the dune, meaning that there will not be any significant topography turnover due to natural factors (Natural Resources Conservation Service). Additionally, the site was once home to the Phillips 66 Oil Refinery that laid foundation over the sandy soils where most construction will occur. Therefore, most construction should not result in substantial soil erosion that has not already occurred. However, new construction will be required that will cause significant levels of soil erosion, particularly the pipelines to and from the ocean for seawater withdrawal and subsurface discharge. These will be dug underground, requiring excavation of soils.

**Recommendations:**
Ground foundation already exists where most of the project construction will occur. However, it is essential that if more foundation is laid down or construction occurs off the existing foundation that the construction is properly documented and mapped so it can be subject to close monitoring.
monitoring for exacerbated rates of soil erosion. The most effective method of choosing the least erosive path for the intake and discharge pipeline would be to consult with geotechnical experts. This will be difficult to choose a path that is ideal for soil erosion purposes as the pipelines also need to consider biological, water, aesthetic resources, as well as consider economic costs. Sufficient monitoring is suggested to observe unnatural rates of wind and water erosion that may be caused by the project.

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

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<th>Impact Statement:</th>
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<tr>
<td>The project site is located on a geological unit that is potentially unstable and can maybe result in liquefaction, lateral spreading, and collapse.</td>
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<tr>
<th>Avoidance Measure #1 (AM GEO-6):</th>
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<tr>
<td>To avoid the above impact, the applicant would need to consult a geotechnical expert on risks of lateral spreading and subsidence.</td>
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</table>

Landslides and liquefaction are noted previously in this impacts section. The project site has significant risks of liquefaction and no significant risks of landslide. There is likely no significant risk of lateral spreading as lateral spreading usually occurs by earthquakes creating fissures in the consolidated earth. The soils on the project site are loose sand and not highly consolidated. Subsidence is also not likely as it is frequently caused by groundwater pumping and geological characteristics within the soils such as limestone deposits that corrode over time (United States Geological Survey). Groundwater will likely not be pumped out of wells from the project itself. The nearby cities and towns draft water from the water table, especially the City of Santa Maria that has a large agricultural industry, however, the project itself will not cause any exacerbated forms of subsidence.

**Recommendations:**
The project will need to run a liquefaction potential test as described previously in this impacts section to understand risks of liquefaction and apply mitigation measures.

**Would the project be located on expansive soil, creating substantial direct or indirect risks to life or property?**

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<th>Impact Statement:</th>
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<tr>
<td>High percentages of sand and low content of 2:1 phyllosilicate clay particles within the soil profile indicate that the project site soils are not expansive and pose no risk.</td>
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Expansive soils, also known as shrink-swell soils frequently fall under the soil taxonomic class of vertosols. They are defined by a high content of 2:1 phyllosilicate clay particles that hold water
between particles and expand during the wet season. When the soils lose moisture in the dry season, they shrink. This can lead to a high degree of infrastructural damage. However, with low contents of clay in the soil, this issue is irrelevant. Reference Figure 15 to see the high contents of sand in the soils (Natural Resources Conservation Service).

**Recommendations:**
As there is little to no possibility of significant impacts, Grey Pine Consulting has no recommendations to reduce impacts.

**Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste?**

**Impact Statement:**
If the proposed project decides to use sewer disposal for waste discharge, access to disposal via sewage should not be an issue. The project site is 12.5 driving miles from the Santa Maria Wastewater Facility where the concentrate could be treated. Additionally, the proposed project will not entail any waste treatment through septic tanks or evaporation ponds meaning that the soil will not have to withstand such use, making this not a significant area of concern.

The briny discharge is the main concern of wastewater, and, as the project description notes, that will be handled through submerged discharge in the ocean. Therefore, that wastewater will not have to be treated through the sewage system or on the project site through deep well injection or evaporation ponds. Other wastewater can be sent to the Santa Maria Wastewater facility which is 12.5 driving miles from the project site.

Although the project will not be using the soil in any way to dispose of wastewater, it is worth pointing out that the project site is very limited in its ability to safely treat waste. The coastal dune soils are mostly composed of sand that will allow water to percolate through the soil profile very quickly. If the project were to use any sort of onsite waste treatment such as an evaporation pond, a mitigation measure such as a pool liner or contamination leak sensor within the soil profile would be mandatory (Natural Resources Conservation Service).

**Recommendations:**
As there is little to no possibility of significant impacts, Grey Pine Consulting has no recommendations to reduce impacts.

**Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?**
Impact Statement:
There are small sections of the project site that hold water year-round and contain anaerobic processes, classifying them as hydric soils. The proposed project will likely indirectly and directly significantly impact these hydric soils.

Avoidance Measure #1 (AM GEO-7):
To avoid the above impact, the applicant would need to identify extent of hydric soils on foot and with the naked eye to measure the acreage and true location of hydric soils on the site.

Avoidance Measure #2 (AM GEO-8):
To avoid the above impact, the applicant would need to prohibit excavation, waste discharge, and construction directly on wetland soils.

Avoidance Measure #3 (AM GEO-9):
To avoid the above impact, the applicant would need to perform continuous monitoring of the health of these wetland soils.

Hydric soils are soils that have water year-round and thus exhibit anaerobic processes that are unique to these soils. They are a main classification of wetlands which have a high degree of biodiversity and carry out numerous ecosystem functions such as water purification, migratory bird habitat, and habitat to many highly specialized and well adapted species (Natural Resources Conservation Service). Protecting these soils is of great concern and well worth the resources to satisfy scrutiny from the public eye. The greatest issue regarding these hydric soils is the construction phase. The construction of the plant and the pipelines to sea could be detrimental to the integrity of these soils.

Recommendations:
It is essential that an initial study is conducted that measures out the true range and extent of these soils on the site with waypoints and polygons created from on the ground measurements. See figure 12 for areas most likely to host hydric soils. The project can then use this information to ensure that no construction, excavation, or waste discharge occurs on these hydric soils. Additionally, frequent monitoring of soil health and integrity is necessary to ensure that no cumulative impacts arise from the project.
Figure 18: Map and corresponding legend illustrating hydric soils on project site located in San Luis Obispo County, CA.
4.5 Recreation

4.5.1 Issue Area Description
The project site is located in an area of the Central Coast where recreation opportunities are a major attraction. The project site itself does not include any existing recreational infrastructure nor are any of the parcels zoned for recreation. However, the location is surrounded on all sides by recreation that is relevant to the state and regional area. The project site shares a border to the west with the ODSVRA. To the southwest lies the Oso Flaco Day Use Area and Oso Flaco Lake Trail. To the north and east the Juan Batista De Anza National Historical Trail follows State Highway 1 and directly borders the east boundary of the project site. More distant surrounding opportunities for recreation include the Guadalupe-Nipomo Dunes Natural Wildlife Refuge, Cypress Ridge Golf Course, Black Lake, Black Lake Golf Resort, and the Monarch Dunes Golf Club. The nearest vertical coastal access points are located approximately 3.6 miles to the north (pedestrian and vehicle) and 0.74 miles to the south (pedestrian only) (Nall, 2019).

Oceano Dunes State Vehicular Recreation Area
The ODSVRA composes 3,490 acres of coastal dunes with around 2,500 acres open for public off-highway vehicle (OHV) use. This is one of only two California State Parks that offer OHV recreation on the Central Coast, and it is the only state-managed public land in California where motorized recreation and camping are allowed on the beach. This provides for a unique public access recreational opportunity and draws almost 1.5 million visitors annually with vehicular use in the hundreds of thousands (California Coastal Commission, 2021). Popular non-motorized activities within the ODSVRA include surfing, swimming, surf fishing, beach day use, horseback riding, and bird watching. Primitive camping is permitted within much of the dune area with a limit of 1,000 street-legal vehicles for camping per night. Other vehicle limits include 2,580 street-legal vehicles and 1,720 OHVs for day use (AECOM, 2021a). The ODSVRA includes areas such as the Pismo Dunes Natural Reserve that are closed to motor vehicles and dogs but open to pedestrians as well as a 300-acre fenced enclosure that is closed seasonally from March to October to protect the snowy plover and least turn during the breeding season (California State Parks, n.d.).

The California Department of Parks and Recreation has expressed interest in the Phillips 66 Refinery Site as a potential site for expanded recreation opportunities associated with the ODSVRA and Pismo State Beach. The Pismo State Beach and ODSVRA Draft Public Works Plan and Draft Environmental Impact Report (EIR) includes conceptual plans for almost 2,000 acres of parkland connected to and utilizing the State Parks owned land directly to the west and south of the project site as well as the entirety of the project site itself. This recreational development would involve multiple OHV uses, a day use area, camping opportunities, non-motorized trails, and a park maintenance and operations facilities area (AECOM, 2020c). This document is currently undergoing public review, however this conceptual expansion involving the Phillips 66 Refinery Site has already raised significant concern from the California Coastal Commission regarding its inconsistency with the Local Coastal Plan and likelihood of causing major disruption to EHSA areas (California Coastal Commission, 2021).
The Local Coastal Plan is a requirement under the California Coastal Act where local governments must determine land use designations and management practices in Local Coastal Plans that provide and protect opportunities for recreation in the Coastal Zone. It is intended to “protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources” (MRS, 2014). In contrast, the 2005 California Recreation Policy, from which California State Parks determines policy goals, establishes opportunities and access to recreation facilities or activities and is intended to be followed by recreation suppliers at all levels to “provide Californians with the high-quality recreational opportunities they deserve and have come to expect” (California State Parks, 2005). The disparities between the directives of these two agencies create conflict about the future of OHV recreation in the California as well as at the ODSVRA and the project site.

**Oso Flaco Day Use Area and Lake Trail**
The Oso Flaco Natural Area falls within the southern end of the ODSVRA, approximately 1.75 miles southwest of the project site. It includes opportunities for wildlife viewing and the 1 mile Oso Flaco Lake Trail offering fishing, coastal dunes hiking, and ocean views. The day-use area includes picnic tables, interpretive panels, restrooms, walking paths, and a boardwalk crossing a portion of the lake (Dunes Center, n.d.).

**Juan Batista De Anza National Historical Trail**
The Juan Batista De Anza National Historical Trail consists of the general presumed path mapped by the National Park Service of the 1776 Anza expedition from New Spain overland into California. The mapped corridor connecting various historic sites passes through the project site, and a recreational segment of the trail exists alongside State Route 1 as it passes to the east of the project site (MRS, 2014).

**Guadalupe-Nipomo Dunes National Wildlife Refuge**
The Guadalupe-Nipomo Dunes National Wildlife Refuge consists of 2,553 acres of protected breeding land for the endangered California least tern, California red-legged frog, and threatened Western snowy plover. It is located approximately 2 miles southwest of the project site and lies in the heart of the Guadalupe-Nipomo Dunes Preserve. The Refuge offers numerous recreational opportunities including hiking, wildlife viewing, and fishing and can be accessed from the Rancho Guadalupe Dunes County Park to the south or the Oso Flaco Natural Area to the north (The Nature Conservancy, n.d.).
Figure 19: Surrounding recreation areas of interest to the project site located in San Luis Obispo County, CA.
4.5.2 Potential Environmental Constraints and Recommendations

Would the proposed project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration would occur or be accelerated?

Impact Statement:
The Nipomo Mesa Desalination Plant Project would not increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration would occur or be accelerated. However, the construction of the desalination plant may cause small recreational impacts to the nearby Oceano Dunes State Vehicular Recreation Area.

Avoidance Measure #1 (AM REC-1):
To minimize impact to recreational opportunities surrounding the project site, the construction of the desalination plant intake pipes (and relevant outtake pipes) should occur during off-peak months (November to March) of tourism and outdoor recreation as much as possible.

Avoidance Measure #2 (AM AES/REC-2):
To prevent or minimize impact to recreational opportunities surrounding the project site, any desalination intake and outtake pipes going to and from the Pacific Ocean would need to be built underground as opposed to above-ground.

The NMDPP would modify the existing industrial uses on the project site as well as perform ecological restoration of the degraded dune habitat and degraded Little Oso Flaco Creek. The implementation of the desalination plant on the existing refinery site footprint will not have any impact on the recreational functions of the project site, as the site does not currently serve any recreational purposes. It is expected that the employees involved in the construction and operation of the desalination plant will be sourced largely from the local community in keeping with the project objectives, and so use of existing recreational facilities will not increase significantly. The ecological restoration of the dune habitat and Little Oso Flaco Creek will similarly take place on the project site where there are currently no recreational facilities or functions. This restoration will be implemented by members of the local community and will not increase the use of the surrounding recreational facilities. None of the proposed uses on the project site are likely to draw visitors to the area in any significant way so it will not strain the nearby existing recreational facilities with additional visitors.

The most convenient coastal access for the desalination intake pipes will likely involve going through the ODSVRA. The construction and implementation of these intake pipes has the potential for some minor impacts to the recreational opportunities at the ODSVRA, particularly the OHV recreation and camping area. It is expected that small sections of the ODSVRA would need to be closed or blocked off to allow for uninhibited construction of the pipelines. However,
these closures would impact the ODSVRA for only short time periods and would impact a relatively small portion of the recreational area, unless the pipelines remain aboveground and need to be fenced off.

**Recommendations:**
These impacts can be minimized through Avoidance Measures REC-1 and AES/REC-2. Implementing construction in the ODSVRA during the off-peak months rather than during peak times will reduce the number of park users who are affected by closures and restrictions. Ensuring that the pipelines are belowground where they cross the ODSVRA will also ensure that any permanent closures or restricted areas are limited in size and extent, thus allowing the recreational capacities of the park to exist at its highest capacity.

**Would the proposed project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?**

**Impact Statement:**
The NMDPP would not include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. However, the use of the project site for non-recreational functions may impact desired future expansion and increased use of the nearby ODSVRA.

The proposed desalination plant and ecological restoration of the degraded dune habitat and Little Oso Flaco Creek does not include any recreational facilities, nor does it require construction or expansion of any recreational facilities. However, the Philips 66 Refinery site has been under scrutiny by California State Parks and other local stakeholders as a potential site for increased recreational facilities. The Pismo State Beach and Oceano Dunes State Vehicular Recreation Area Draft Public Works Plan includes a conceptual project upon acquisition of the project site by State Parks including nearly 2,000 acres of parkland with day-use and camping opportunities along with motorized and non-motorized recreation (AECOM, 2020c). The NMDPP would supersede this conceptual project and may limit the plans of State Parks to increase recreation in this area, particularly OHV recreational opportunities. However, such expansion of OHV recreation is opposed by the Coastal Commission who requests that all OHV use be phased out over a 5-year period (California Coastal Commission, 2021). This would leave the ODSVRA open to general public use and vehicular/camping use in the northern portions. Thus, although the NMDPP does not allow for expansion of recreational facilities as proposed by State Parks, the ecological restoration of the project site more closely matches the goals of the Coastal Commission.

**Recommendations:**
Grey Pine Consulting does not have any recommendations for minimizing recreational impacts regarding included facilities or required construction or expansion of existing facilities because no constraints of this manner are expected. Though the NMDPP may conflict
with the recreational desires of State Parks, this dispute cannot be mitigated by any means other than fundamentally altering the nature of the Project and is therefore not feasible.
5. Environmental Processes and Permits

Should the proposed Nipomo Mesa Desalination Plant Project be pursued by an applicant, the project will need to go through a series of regulatory processes, such as following various California Environmental Quality Act (CEQA) steps and guidelines. Additionally, the project will need to be conducted in compliance with standards set by local, state, and federal entities. The following subsections will review the processes, permits, and steps likely needed to carry out the project.

5.1 County and Coastal Land Use Permitting

Grey Pine Consulting recommends that the project applicant request a pre-application conference with the County Department of Planning and Building early on in the planning process in order to discuss applicable policies, plans, standards, and requirements, as well as reviewing application procedures. Due to the unique nature of the proposed desalination plant in the context of San Luis Obispo County, this meeting will serve to define and discuss how such a use will fit in to the General Plan, the Coastal Zone Land Use Ordinance, and the South County Coastal Area Plan (County of San Luis Obispo, n.d.). Given that a desalination plant is not a use specifically listed in Section D, Chapter 7, Part I of the Coastal Zone Land Use Element, a letter must be sent to the Planning Director requesting a review of the proposed use and a determination of which of the uses listed in the Land Use Element most closely resembles that proposed. This equivalent use will then be used when assessing what additional permits and standards are relevant to the proposed project (SLO County Municipal Code §22.06.030).

Unless otherwise specified during the pre-application conference, the next step in the County permitting process will be to submit a Development Plan Application. Upon receiving this application, the Planning Department will notify relevant other agencies including but not limited to the California Coastal Commission, the Engineering Department, the Regional Water Quality Control Board, and Public Utilities. Authorization for both the desalination and the ecological restoration uses may be authorized through a single Development Plan application (County of San Luis Obispo, n.d.).

This application will include a site layout plan, ownership verification, a preliminary floor plan, architectural elevations, a supplementary development statement, and ocean public access locations. The Development Plan Application must also include items required by the Combining Designations in which the project site is located. Due to the majority of the project site (specifically the proposed location of the desalination plant) being in a Flood Hazard Combining Designation, a Drainage Plan must be submitted and approved with the Development Plan. The Development Plan must also include a description of measures proposed to protect the identified resources qualifying the project site as a Sensitive Resource Area Combining Designation. Due to the Environmentally Sensitive Habitat Area (ESHA) present within the project site, a report by an approved biologist must be submitted along with the Development Plan evaluating the impact of the development on or adjacent to the habitat and identifying the biological constraints that need to be addressed to avoid or minimize impacts to ESHA. The
presence of pipelines involved in the operation of the desalination plant mean that a geologic investigation, design, and mitigation program must be included with the Development Plan (SLO County Municipal Code §22.02.034).

The Development Plan Application will not be approved or conditionally approved until an environmental determination has been made as required by CEQA (see section 5.2). Upon completion of this determination, the Planning Department will prepare a staff report describing the project and recommending whether the proposal shall be approved, conditionally approved, or disapproved. This staff report will be presented to the Review Authority during a public hearing in which a decision will be made regarding approval, conditional approval, or disapproval. While the County of San Luis Obispo has the ability to issue Development Plan Permits for projects located in the Coastal Zone, the California Coastal Commission will have the ultimate authority over the approval of the project (SLO County Municipal Code §22.02.036).

An approved Development Plan is valid for 24 months after its effective date unless substantial site work towards establishing the authorized use has been performed, the project is completed, or an extension has been granted (SLO County Municipal Code §22.02.040).

**Development Plan**

The step for acquiring a discretionary permit allowing a specific land use, as outlined on the County of San Luis Obispo’s website, are:

- **Step 1 (recommended): Pre-Application Meeting**
  - Helps potential applicants understand requirements and regulations to apply to the proposed project
- **Step 2: Submit Land Use Permit application to County of SLO**
- **Step 3: Pay Invoice**
- **Step 4: Review by Dept. Planning & Building**
- **Step 5: Public Hearing**
- **Step 6: Reach Decision**

**Coastal Development Permitting**

The proposed NMDPP is in a Coastal Zone and is therefore subject to jurisdiction beyond San Luis Obispo County through the State of California via the CCC. To proceed with development in a Coastal Zone, a Coastal Development Permit has to be issued by either the CCC or a local government. As defined on the CCC’s website, Coastal Development Permits are the regulatory mechanism by which proposed developments in the coastal zone are brought into compliance with the policies of Chapter 3 of the Coastal Act (California Coastal Commission, n.d.).

While the County of San Luis Obispo has the ability to issue development permits for projects in located in the Coastal Zone, it is ultimately up to the CCC to decide if the permits will be approved or not. This CCC approval will be determined at the public hearing for the Development Plan Application or shortly thereafter (SLO County Municipal Code §22.02.036).
SLO County Coastal Allowable Use Table
The SLO County Coastal Allowable Use Table (Coastal Table “O”) is a document that describes the 13 land use categories for allowable construction in San Luis Obispo County. The categories most applicable to the proposed desalination plant are industrial and public facilities. Both the purpose and character of the industrial land use category and public facilities land use category are described in the document. The character statements identify suitable conditions and features for the location of the project, and the purpose is used as criteria for evaluating whether a Land Use Element amendment is appropriate for a specific site. A desalination plant would qualify for the public facilities land use category if the ownership were public and would qualify for the industrial land use category if the ownership were private. In addition to these land use categories, there are use statuses that apply to each of the land use categories. The following use statuses are determined relevant in the following paragraph: P and S. P represents a principally permitted use that is encouraged and prioritized over non-principally permitted uses, but does not have priority over coastal dependent uses. Use status S represents a special use that is subject to special standards and/or processing requirements. Further information is discussed in Section B.

Section B of the same document outlines the allowable land uses in the coastal zone of San Luis Obispo County. The desalination plant could qualify for the following use groups: F5 and J5. Group F5 represents resource extraction for water wells. While this project may not require water wells, structures that extract water are deemed relevant in the definitions. Regardless if the desalination plant is deemed to be in the industrial land use category or not, all land use categories for group F5 have a categorization of S-9-P. S-9-P corresponds to the resource extraction land use element requirement and the applicable coastal zone land use ordinance section is 23.08.170. Unlike group F5, Group J5 represents Public Utility Facilities. This use group will be pertinent to the desalination plant because treatment plants qualify as a public utility facility. In addition, this group is not affected by Government Code Section 53091 but is instead affected by the Local Coastal Plan. The J5 group is classified as S-13 for all land use categories, except the classification is P for the land use category Public Facilities. S-13 follows the transportation, utilities & communication land use element requirement and the applicable coastal zone land use ordinance section is 23.08.280. Based on the previous use groups, there are Coastal Plan Policies planning area standards and Land Use and Circulations Elements that apply. The specific relevant standards to this project will be identified in the pre-application meeting and when the Planning Director determines an appropriate equivalent use for the desalination plant.

South County Coastal Area Plan
The county land use policies for the coastal zone portion of the South County Planning Area are described in the South County Coastal Area Plan, and the report includes regulations which are also adopted as part of the Land Use Ordinance and Local Coastal Program (LCP). Chapter 8 of the document outlines the relevant planning area standards for public services, circulation, and land use, and provides criteria for detailed evaluation of development projects. The planning area standards are mandatory requirements for development. For the industrial use category, as
discussed in SLO County Allowable Use Table, the following standards apply specifically to the proposed project site:

1. Permit Requirements
   a. Phasing plan for staging development indicating the anticipated time table and site plans for project initiation, expansion possibilities, completion, consolidation possibilities, and decommissioning. (LCP)
   b. A fire protection system approved by the governing authority. (LCP)
   c. Screening of the facilities from public view through height limitations, careful site design, artificial contoured banks and mounding, extensive landscaping, and decorative walls and fences. (LCP)
   d. Any part of the facilities that cannot effectively be screened by the above methods shall be painted with nonreflective paint of colors that blend with the surrounding natural landscape. (LCP)
   e. Oil spill contingency plan (using most effective feasible technology) indicating the location and type of cleanup equipment, designation of responsibilities for monitoring, cleanup, waste disposal and reporting of incidents and provisions for periodic drills by the operator, as requested by the county, to test the effectiveness of the cleanup and containment equipment and personnel. (LCP)

2. Limitation on Use
   a. Not applicable for a desalination plant

3. Site Location
   a. minimize impacts to identified rare and endangered plant species and be located to provide a buffer from exposed dune areas on site. A qualified biologist shall survey the site and make recommendations on siting alternatives and appropriate mitigation. (LCP)

4. Buffer Zones
   a. No facilities shall be located in the area west of the railroad, which shall serve as a protective, natural buffer separating the heavy industrial use from the recreational activities within the dunes. This buffer area shall be managed cooperatively between the property owners and the California Department of Parks and Recreation to encourage dune revegetation and stabilization within the buffer area. A buffer area shall be required to reduce impacts to the nearby residential areas. (LCP)

5. Air Pollutions Standards
   a. Any expansion or modification of existing petroleum processing or transportation facilities or the construction of new facilities shall meet San Luis Obispo County Air Pollution District (APCD) standards. (LCP)

5.2 California Environmental Quality Act Processes
The California Environmental Quality Act, commonly referred to as CEQA, is a California statute enacted in 1970 and mandates that all public agencies in the state, whom are proposing
projects which have the potential to impact the environment's quality, do so in a way that is not significant. To determine if a project may have a significant impact on the environment, a lead (public) agency may conduct an Initial Study (State CEQA Guidelines § 15063).

If it is determined that a project would have one or more significant effects upon the environment, then an Environmental Impact Report, or EIR, must be prepared. (State CEQA Guidelines § 15060). The decision to prepare an EIR will be based on substantial evidence (State CEQA Guidelines § 15064). EIR initiation, EIR planning, and EIR finalization are the three phases of the EIR study. The data collection and scoping requirements taken by CEQA statutes will begin during the EIR initiation process. The EIR will provide comprehensive details about the major impacts of a proposed project in compliance with CEQA guidelines section 15121 (CEQA FAQ, 2017). The potential project-specific and cumulative environmental impacts, both direct and indirect, that could result from the project's implementation will be considered in this study. These potentially significant impacts must be disclosed in the EIR, along with outlining practical steps to mitigate said impacts while still fulfilling the project's objectives.

**Phase 1 – EIR Initiation**

To initiate the EIR process, a kickoff meeting between the applicant, lead agency, and other invested stakeholders will take place. This kickoff meeting will provide the underlying foundation for the EIR, as it will address the initial procedure, including a detailed timeline and a list of priority items to address immediately.

The data exchange and collection process are the first item to address. This element would entail the applicant presenting useful project data, such as flood risk, geologic hazard zones, and acoustical analysis data, among other data. The project manager will also conduct biological surveys and a site assessment analysis to gather additional pertinent data.

To ensure a sound EIR document is prepared, the project manager will determine what the project entails and how to proceed. The scope and extent of the EIR document will be calculated in order to accomplish this. Scoping avoids minor environmental risks, allows for public participation, and is an efficient way to address concerns before they occur. In compliance with State CEQA Guidelines 15082 and Public Resources Code 21080.4, the project manager will inform agencies and the general public of the dates and time of the scoping meeting, engaging the public and responsible agencies to help decide the form and scope of the EIR (CEQA: The California Environmental Quality Act - Office of Planning and Research, n.d.).

Following that, a notice of preparation document will be produced, and an EIR will be issued (CEQA Document Submission - Office of Planning and Research, n.d.). The following will be included in this document:

- Description of project site
- Location of project site
- Date, place, and time of the public hearing
• Discussion of probable environmental effects
• Address where documents available for review
• Address where written comments on the scope of the EIR may be sent
• Deadline for submitting comments

(State CEQA Guidelines § 15082; Public Resources Code § 21080.4)

The office of planning and research, each responsible agency and each trustee agency responsible for services impacted by the project, and the general public will receive the notice of preparation document. State CEQA Guidelines 15082(3) require that the notice of preparation be issued in such a way that a record of the notice is retained. The notice of preparation will be available to these individuals for 30 days for review and comment. The project manager will host public forums to involve the public during this review process, offering an opportunity for members of the public and key stakeholders to share their views and concerns about the project's implementation.

Phase 2 – EIR Preparation
The Project Manager will move on to the second step of the EIR project, which is the preparation of the EIR documents, once the EIR has been initiated.

The Project Manager will create a EIR draft that includes the following:

• Table of contents (State CEQA Guidelines § 15122)
• Executive summary including:
  o Identification of each significant impact along with the proposed mitigation measures and/or alternatives that would reduce or avoid each impact.
  o Discussion of the areas of controversy known to the Lead Agency, including issues raised by agencies and the public.
  o Identification of the issues to be resolved, including the choice among alternatives and how to mitigate significant impacts. (State CEQA Guidelines § 15123)
• Project description including:
  o Precise location and boundaries of the proposed project on a detailed map.
  o Location of the proposed project on a regional map.
  o A statement of project objectives, including the underlying project purpose.
  o A general description of the project characteristics.
  o A brief statement of the intended uses of the EIR to the extent known to the Lead Agency, including a list of other agencies that are expected to use the EIR in decision making, a list of permits and approvals required to implement the project, and a list of related environmental review and consultation requirements required by laws, regulations, or policies. (State CEQA Guidelines § 15124)
• Environmental setting, consisting of a description of the physical environmental conditions in the project vicinity as they exist at the time the NOP is published. (State CEQA Guidelines § 15125)

• Identification of the following environmental impacts:
  o Direct
  o Indirect
  o Short-term
  o Long-term
  o Cumulative
  o Unavoidable

• Discussion of environmental impacts, including:
  o Significant environmental effects of the project. (State CEQA Guidelines §§ 15126 and 15126.25(a))
  o Significant environmental effects that cannot be avoided if the project is implemented. (State CEQA Guidelines §§ 15126 and 15126.25(b))
  o Growth-inducing impacts of the project. (State CEQA Guidelines §§ 15126 and 15126.2(d))

• Mitigation measures to minimize significant impacts. (State CEQA Guidelines §§ 15126 and 15127)

• Effects found not to be significant

• Discussion of alternatives, including:
  o Evaluation, analysis, and comparison of a reasonable range of alternatives that would attain most of the basic project objectives and would avoid or reduce any of the significant impacts of the project. Only feasible alternatives should be considered.
  o Evaluation and analysis of the “no project” alternative, which describes impacts that are reasonably expected to occur in the foreseeable future if the proposed project is not approved.
  o Identification of the environmentally superior alternative.
  o Identification of alternatives that were considered but rejected by the Lead Agency and the reasons for their elimination. (State CEQA Guidelines § 15126 and 15126.6)

• Significant irreversible changes

• References, organizations, and persons consulted (State CEQA Guidelines § 15129)

The project manager will prepare an administrative and public review draft. The project manager and the lead agency will keep the administrative draft confidential. The lead agency will be able to update the draft and have the project manager make the requisite adjustments and alterations. According to CEQA guidelines, the draft EIR will be completed within 45 days of the lead agency’s decision to prepare the draft EIR (Pub. Res. Code 21151.5(c)). A public draft will also be prepared for distribution to the general public. The project manager will oversee both delivery and promotional logistics. A website will be created to broadcast project specifics, including hosting noticing criteria, public hearing dates, times, and places, as well as any other
relevant information, such as PowerPoints and records, pertaining to the CEQA process for this project. A Notice of Completion form will be sent to the State Clearinghouse, indicating that the draft document is complete and ready for review, and a Notice of Availability for the Draft EIR will be published (State CEQA Guidelines 15085). The Notice of Availability form informs the public that a Draft EIR is available for public review and will be delivered to the county clerk of the project’s location for at least 30 days (Public Resources Code 21092.3 and CEQA Guidelines 15087 (d)) (Law Section, n.d.). For at least 45 days, the project manager will consider feedback on the Draft EIR (State CEQA Guidelines § 15087).

Phase 3 – EIR Finalization
The project manager will prepare the Final EIR after the Draft EIR documents have been prepared and circulated. The EIR is now open to the general public and decision-makers. In this section, final decisions and policy changes will be made.

The final EIR will consist of the following:

- The draft EIR/revision of the draft EIR from responses (State CEQA Guidelines § 15132)
- Comments and recommendations on the draft EIR o Includes comments received by email.
- A list of persons/agencies commenting on the draft EIR.
- Responses to significant environmental points/substantive comments raised in the review and consultation process.
  - At least 10 days prior to project approval, the project manager will respond to public agency feedback. 21092.5 (PRC)
  - Well-reasoned written answers with full disclosure will be given in response to comments in the Final EIR.
  - Responses to comments will be a separate section in the final EIR.
- Comments received after final EIR certification will be considered.
  - The final EIR will be made up of responses to comments received on the draft EIR and the draft EIR paper.
- If substantial new information is added to the EIR after the public review period ends, recirculation of the draft EIR may be required; however, this is uncommon and should not be taken into the calculus of decision making and planning.
  - Necessary when a new environmental impact may result from proposed mitigation measure yet to be implemented.
  - Summary of previously circulated EIR will be included in the Final EIR (State CEQA Guidelines § 15088.5(2))
- Certification of final EIR
  - The decision-making body of the lead agency must evaluate and certify that the EIR represents the agency’s own objective judgment before making a final decision on how to proceed with the EIR (PRC 21082.1(c)(3)).
In accordance with CEQA, the EIR document will be completed and certified within one year at which the application was determined complete.

- Judicial standards
  - If no legal action is taken against the lead agency for violating CEQA, the final EIR is CEQA compliant. ((PRC 21082.1(c)(3)))

Timeline
While Grey Pine Consulting cannot guarantee the exact timing of the CEQA EIR process, included in the table below is an estimated time frame for the individual EIR steps that will need to be completed for the proposed Nipomo Mesa Desalination Plant Project.

Table 5: Estimated Times for the EIR Process

<table>
<thead>
<tr>
<th>Event/Step</th>
<th>Estimated Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare Notice and Proposal, receive public feedback</td>
<td>30 days</td>
</tr>
<tr>
<td>Establish significance thresholds and methodologies</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Write administrative draft EIR</td>
<td>8 weeks</td>
</tr>
<tr>
<td>Write public draft EIR</td>
<td>8 weeks</td>
</tr>
<tr>
<td>Conduct public review and assess public comments</td>
<td>30 weeks</td>
</tr>
<tr>
<td>Revise drafts heeding concerns raised in the review process</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Conduct Hearings</td>
<td>5 weeks</td>
</tr>
<tr>
<td><strong>Total (Estimated) Time:</strong></td>
<td><strong>69-70 weeks</strong></td>
</tr>
</tbody>
</table>
5.3 Federal and State Approval

The proposed NMDPP, should it be pursued by an applicant, will be subject to the approval of various Federal and State agencies, specifically those that have jurisdiction over hydrological and biological resources. The required approval or necessary permits will depend on location and design factors of the proposed desalination plant, as well as the restoration efforts of the Little Oso Flaco Creek. While Grey Pine Consulting is providing initial information in this document about the permits likely needed prior to development of the project, the applicant may additionally request to hold a Pre-Application Meeting with the County of San Luis Obispo to understand the specific requirements and permitting process for the Nipomo Mesa Desalination Plant.

In the table below, Grey Pine Consulting identifies the agencies likely to be involved with the proposed project, what permit or approval may be required, their underlying statutes, and which project activity would trigger the permit. Following the table is a discussion summarizing the permitting constraints and next steps for the project team. For the sake of simplicity, Grey Pine Consulting will not be identifying what local permits may be required for the project.
Table 6: Regulatory Permitting Matrix

<table>
<thead>
<tr>
<th>Agency</th>
<th>Permit/Approval</th>
<th>Underlying statute</th>
<th>Regulated Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Federal Agencies</strong></td>
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<td></td>
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<tr>
<td><strong>Water</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>US Army Corps of Engineers (USACOE)</td>
<td>Section 404</td>
<td>Clean Water Act</td>
<td>Construction of Intake/Outfall Permits</td>
</tr>
<tr>
<td>US Fish &amp; Wildlife Service (USFWS)</td>
<td>Section 404</td>
<td>Clean Water Act (CWA) /Endangered Species Act (ESA)</td>
<td>Discharge potentially affecting federally threatened or endangered species</td>
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<td>US Army Corps of Engineers (USACOE)</td>
<td>Section 10</td>
<td>Rivers and Harbors Act</td>
<td>Construction of Intake/Outfall Pipes into a navigable body of water</td>
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</tr>
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<td>US Fish &amp; Wildlife Service (USFWS)</td>
<td>Safe Harbor Agreement</td>
<td>US Endangered Species Act</td>
<td>Actions that contribute to the recovery of listed species on nonfederal lands</td>
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<td>Section 10a (1)(B)</td>
<td>US Endangered Species Act</td>
<td>Lake and Streambed Alteration</td>
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<tr>
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<td>Section 7 Consultation</td>
<td>US Endangered Species Act</td>
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<td><strong>Water</strong></td>
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</tr>
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<td>California Coastal Commission (CCC)</td>
<td>Coastal Development Permit</td>
<td>Coastal Act</td>
<td>Building in a Coastal Zone</td>
</tr>
<tr>
<td>California State Lands Commission</td>
<td>Lease Agreement</td>
<td>Chapter 1, Divison 3, Title 2, California Code of Regulations</td>
<td>Development in locations within Public Trust lands (the beds of tidal and navigable waters</td>
</tr>
</tbody>
</table>
### 5.3.1 Federal Permitting

#### Hydrological Resources

The proposed Nipomo Mesa Desalination Plant will require three permits from the federal level: a Section 404 permit from the USACOE, a section 404 permit from the Department of Fish and Wildlife, and a Section 10 permit from the CWA from the USACOE.

Section 404 of the CWA requires that all projects constructing intake and/or outtake pipelines require a permit for construction. Since this project will be taking in water from the sea and discharging the brine back into the ocean utilizing pipelines, the project will be required to obtain this permit. The federal agency responsible for distributing this permit is the USACOE. The permit requires that mitigation measures are taken to avoid the destruction of wetlands, sensitive aquatic resources, and surface bodies of water. To receive the permit, the project must also include some sort of compensation to make up for the destruction caused (Environmental Protection Agency, 2020). Grey Pine Consulting recommends following avoidance measures listed in the hydrology section of the constraints analysis to show the USACOE that the project

<table>
<thead>
<tr>
<th>Permitting Authority</th>
<th>Permit Type</th>
<th>Relevant Code/Act</th>
<th>Mitigation Measures</th>
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<td>Section 404</td>
<td>CWA Section 402</td>
<td>Avoidance measures</td>
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<td>CDFW</td>
<td>Section 10</td>
<td>Fish and Game Code</td>
<td>Avoidance measures</td>
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<td>Section 106</td>
<td>National Historic Preservation Act</td>
<td>Preservation of Little Oso Flaco Creek</td>
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<td>California Dept. of Fish and Wildlife (CDFW)</td>
<td>CESA Section 2081 Incidental Take</td>
<td>California Endangered Species Act</td>
<td>Lake and Streambed Alteration (LSA) Program</td>
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<td>California Dept. of Fish and Wildlife (CDFW)</td>
<td>FGC Sec 1602 1</td>
<td>California Fish and Game Code</td>
<td>Lake and Streambed Alteration</td>
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<th>Permit Type</th>
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<td>RWQCB Region 3</td>
<td>NPDES</td>
<td>Clean Water Act</td>
<td>Discharge of pollutants (Briny discharge)</td>
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<td>RWQCB Region 3</td>
<td>Requirements</td>
<td>Title 27, California Code of Regulations, section 20005 et seq.</td>
<td>Discharge of pollutants (Briny discharge)</td>
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<td>RWQCB Region 3</td>
<td>Storm Permit</td>
<td>Clean Water Act Section 402 California NDPES Order NO. 2009-0009-DWQ</td>
<td>Discharge of storm water associated with construction activities resulting in the disturbance of greater than or equal to one acre</td>
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<td>Construction</td>
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</tr>
</tbody>
</table>
Environmental Constraints Analysis

Grey Pine Consulting

intends to avoid sensitive hydrological resources. Additionally, a compensation plan should be included such as putting resources into restoring other local water bodies.

Section 404 of the CWA also requires that all projects discharging a pollutant that may affect a federally endangered or threatened species will also require a permit to discharge the pollutant. Since the briny discharge released during the desalination process is listed as a pollutant and does indeed have the potential to harm or take endangered or threatened species, this project will require this permit. The United States Department of Fish and Wildlife are responsible for the distribution of this permit. The Fish and Wildlife Service will be monitoring the impacts that the briny discharge may have on the local ecosystems (Environmental Protection Agency, 2020). To show that the project intends to mitigate damages caused by the discharge, Grey Pine Consulting recommends following avoidance measures listed in biology section of the constraints analysis and incorporating compensation such as investing resources into restoring damaged aquatic ecosystems elsewhere.

Section 10 of the Rivers and Harbors Act requires that all projects constructing intake and/or outtake pipelines into a navigable body of water must have a permit for construction. This project will be constructing intake and outtake pipelines to and from the ocean. Therefore, this project will require this permit. The federal agency responsible for distributing this permit is the USACOE. This permit is required for the same reason as the Section 404 permit listed above as there is overlap between the two. The USACOE will assess and distribute these permits jointly (Federal Emergency Management Agency). Therefore, the same avoidance and compensation measures should be taken to obtain the permits.

**Biological Resources**
The proposed project will require several permits from different federal agencies to fully and properly protect the existing biological resources of the site. The first of those permits comes through the Safe Harbor Agreement (SHA) which is a voluntary agreement established to protect federally listed threatened and endangered species. This agreement is a part of the US Fish & Wildlife Service (FWS). Due to the emissions caused by the operation and construction phases of the project, this agreement will help to smooth the habitat transition and ensure that these species remain preserved.

Another FWS agreement for this project comes up when discussing Lake and Streambed alteration. To undertake that process, a Section 10a (1)(B) incidental take permit to protect any streambed alterations caused by the operational phase of the project. This is also like our final permit required through NOAA, the Section 10(1)b Incidental Take Permit. With legal backing from the US ESA, this will help to protect federally listed anadromous fish species on site. This would also require a NEPA compliance document, as well as a HCP to ensure consistency, as it is a recommendation with each incidental take permit issued by the USFWS.

Finally, with backing from the US ESA, a NOAA Fisheries Section 7 consultation will be the final step in this federal permitting process. Given that this project’s construction, operation and conservation phases will all in some manner affect federally protected species, NOAA dictates
that consultation is required. During this process, the project manager will work with and consult with NOAA Fisheries to abide by their rules, guidelines and regulations.

Timing and timelines for this permitting are all context and circumstance based. The rough guidelines for timing for steps and phases within the permitting process can be found in section 5 (Environmental Processes and Permits).

5.3.2 State Permitting

Hydrological Resources
At the California State level, several permits will be required for this project. The CCC has the ultimate authority over approval of the project, and so a Coastal Development Permit must be obtained before moving forward. However, this Coastal Development permit can be issued by the County of San Luis Obispo in the form of a Development Plan, subject to final approval by the CCC. The Development Plan Application process is detailed in Section 5.1 County Permitting.

A lease agreement must be negotiated with the California State Lands Commission for development to occur on lands that are designated as Public Trust Lands within the project area. This includes all beds of tidal and navigable waters that were acquired at statehood.

A series of permits must be issued by the Regional Water Quality Control Board to be consistent with the National Pollutant Discharge Elimination System and the CWA. This project is located under the jurisdiction of the Region 3 Water Quality Control Board. The construction activities associated with the desalination plant will cause disturbance of greater than one acre with associated storm water discharge, so the applicant must obtain a Construction General Permit from the RWQCB. This permit will require submitting a Storm Water Pollution Prevention Plan. All the Permit Registration Documents must be submitted prior to commencement of construction, and a Waste Discharger Identification Number (WDID) will be assigned upon confirmation of the materials. Once the WDID is issued, the project is covered by the Construction General Permit (California Water Boards, n.d-a.).

The applicant will also need to ensure that the entirety of the project, particularly the briny discharge associated with desalination, follows the requirements set forth in the National Pollutant Discharge Elimination System and the Waste Discharge Requirements of the California Code of Regulations. These regulations are implemented and enforced by the RWQCB (California Water Boards, n.d-b.).

Finally, the preservation and restoration of Little Oso Flaco Creek associated with the project must be consistent with Section 106 of the National Historic Preservation Act. To be compliant, a process must be followed that begins with determining the responsible Federal Agency and identifying relevant consulting parties, in this case including the State Historic Preservation Office (SHPO) and the public. The parties involved will then follow a series of steps to identify historic properties, assess adverse effects, and ideally resolve those effects. If the
effects are successfully resolved, a Memorandum of Agreement (MOA) will be created by which the Federal Agency is obligated to follow. In the event that historic properties are not identified, documentation will be provided by the Federal Agency to the SHPO and other consulting parties. Unless the SHPO or Advisory Council on Historic Preservation object within 30 days, the section 106 responsibilities will be fulfilled (American Indian Liason Office, 2012).

**Biological Resources**

There are not too many permits to gather from State agencies in order to address the biological resources on the project site. Both permits necessary for further project development can be obtained from the California Department of Fish and Wildlife, as depicted in Table XX. There must be documentation of CEQA compliance before either of the permits will be approved.

To be compliant with California Fish and Game Code Section 1602, the CDFW must be notified via a paper submittal (CDFW, 2021a). Grey Pine Consulting recommends that the CDFW should be notified before project development begins, as any activity that affects rivers, streams, or lakes must be reported to CDFW before development commences. The desalination plant is certain to match the criteria outlined in California Fish and Game Code Section 1602, so notifying the CDFW beforehand is urgent. The fees for all of the possible agreements between the applicant and the CDFW is detailed in the California Department of Fish and Wildlife Lake and Streambed Alteration Agreements and Fees document, effective January 1, 2021. The agreement may last less than 5 years, or over 5 years.

Furthermore, an application for an Incidental Take Permit must be completed before project development (CDFW, 2019). The application must be completed before construction, as these permits are generally issued for construction related purposes. The project applicant will submit the application online after paying a fee. The application for the permit contains strict criteria, the following of which are most relevant:

- The common and scientific names of the species to be covered by the permit and the species' status under CESA.
- A complete description of the project or activity for which the permit is sought.
- The location where the project or activity is to occur or to be conducted.
- An analysis of whether and to what extent the project or activity for which the permit is sought could result in the taking of species to be covered by the permit.
- An analysis of the impacts of the proposed taking on the species.
- An analysis of whether issuance of the incidental take permit would jeopardize the continued existence of a species. A complete, responsive jeopardy analysis shall include consideration of the species’ capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of:
  - Known population trends;
  - Known threats to the species; and
  - Reasonably foreseeable impacts on the species from other related projects and activities.
- Proposed measures to minimize and fully mitigate the impacts of the proposed taking.
- A proposed plan to monitor compliance with the minimization and mitigation measures and the effectiveness of the measures.
- A description of the funding sources and the level of funding available for implementation of the minimization and mitigation measures.

The main idea is that each species must be listed in the application, along with the mitigation efforts to prevent significant population decline and the evidence supporting these mitigation efforts as most effective. The cost of this permit can be upwards of about $40,000 in 2021 (CDFW, 2021a). There is no direct indication of how long the permit will last, but based on context the permit should satisfy the construction and operational phases of the project.

6. Summary of Findings

![Map illustrating environmental constraints summary of findings at and around the project site located in San Luis Obispo County, CA.](image)

Figure 21: Map illustrating environmental constraints summary of findings at and around the project site located in San Luis Obispo County, CA.

In its entirety, this document provides a comprehensive analysis of environmental constraints for the Nipomo Mesa Desalination Plant Project based on literature reviews and online research. To
complement and display pertinent research, a team of NR 425 students specializing in Geographic Information Systems (GIS) worked to create many of the maps provided in this ECA, such as the final map (Figure 21) summarizing the relevant findings.

Figure 21 displays a visual summary of findings from the environmental constraints analysis. The physical environmental constraints of most concern in the immediate area of the project site are geological liquefaction, biological terrestrial habitat, and biological wetlands. The western portion of the project site contains the most environmental constraints. There is high potential for liquefaction on the northwestern-most sites, particularly on parcels 092-391-034 and 092-391-020. These two parcels are also located within the identified constraints area for several biological resources, including sensitive resource habitat, riparian vegetation and wetlands. These biological and geological constraints will be relevant for the project ecological restoration for the coastal dunes as well as Little Oso Flacco Creek.

The current refinery site footprint, which is proposed as the site of the desalination plant, is not located in a high liquefaction potential area or a sensitive resource area. However, it is within view of State Highway 1, which raises concern over aesthetic resource constraints. This portion of the proposed project has also been identified as having minor recreational impacts, though they are broad and thus not featured in the constraints map.

This map does not display all of the environmental constraints associated with the Nipomo Mesa Desalination Project. However, it exhibits the location-based physical constraints in a visual summary to allow for the best understanding of what issues will need to be taken into account for this project to move forward in the development process.
List of Preparers
A group of five students within Sarah Spann’s NR 425 Spring 2021 course at California Polytechnic State University San Luis Obispo operated as the fictional Grey Pine Consulting to prepare this Environmental Constraints Analysis –

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Zachary Kariya, 4th year Environmental Management & Protection major
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Environmental Constraints Analysis

Nipomo Mesa Desalination Plant Project

Central Coast Economic Recovery Initiative

Spring 2021
Environmental Constraints Analysis

T.E.J.A.J.A. Consulting Firm

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Jesse Stewart

Disclaimer: The following document has been prepared as part of the undergraduate curriculum for NR 425 (Applied Resources Analysis and Assessment) at California Polytechnic State University, San Luis Obispo. The intent of this academic exercise was to simulate the real-world process of preparing an environmental constraints and permitting analysis; however, it is important to note that the environmental and permitting constraints identified herein have not been technically peer reviewed by subject matter experts. This document is to be used for informational purposes only.
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1 Introduction

1.1 Project Purpose and Need
The Phillips 66 refinery plant in Santa Maria, California will be permanently closing in 2023. Although there are many potential uses for the facility, this project focuses on the implementation of a desalination plant. The Nipomo Plant Desalination Plant Project is a part of the Central Coast Economic Recovery Initiative, and it would provide clean and safe water for the surrounding communities. The Purpose of the project is to assist guidance and research to the Economic Recovery Initiative, to help determine the constraints of the desalination plant, and therefore determine the feasibility and steps needed to build a plant.

Desalination is critical to economic and environmental sustainability as the central coast of California continues on the path of a drier climate. There needs to be an economically viable solution in close proximity to the affected areas since the current water situation is said to become worse over the next couple decades. Repurposing the Phillips 66 refinery as a desalination plant would provide treated water to new on-site uses, agricultural/residential water supply, and the restoration of Little Oso Flaco Lake. Restoration of Little Oso Flaco Creek would acknowledge the resolution to amend the water quality control plan as requested by The Regional Water Quality Control Board.

1.2 Purpose and Scope of the Environmental Constraints Analysis
This draft Environmental Constraints Report is prepared in accordance with the California Environmental Quality Act (CEQA) to screen for potential issues that may pose a constraint to successful implementation of the Nipomo Mesa Desalination Plant Project. The purpose of this report is to document the project’s objectives and phases of progress, describe the involved stakeholders, provide general environmental constraints, including hydrology and water quality, biological resources, air quality, and aesthetics, as well as detail the specific permits and processes required. The report will provide preliminary information to stakeholders and potential developers about the time required for the permits to be approved before construction begins, and also which permits will be required during certain phases of development. There were no surveys done by the class for the environmental issue areas, rather a compilation of desalination plant information such as environmental impact reports from the Carlsbad, Huntington Beach, and Tampa Bay desalination plants.

In order to evaluate the environmental constraints, a number of assumptions of were made for this project. Such assumptions are that the desalination plant will use reverse osmosis, submerged discharge as concentration management, and freshwater distribution pipelines were not evaluated. Restoration of both Little Oso Flaco Creek and dune habitat is also assumed for the second part of the project.
2 Project Description

2.1 Project Location and Existing Site Characteristics

The project location is at the Phillips 66 Santa Maria Refinery. The site is near Highway 1. Finding parcel data was difficult for this report, so screenshots were taken from the Land Use View website provided by the county of San Luis Obispo. In the future, parcel data will be a layer in order to create appropriate regional and site maps. For the purpose of this report, the screenshots are efficient enough in displaying the site location. Two map views and screenshots were taken to provide context of the region and site based on available parcel data.

Figure 2.1. A regional map of the project location. The black line represents the San Luis Obispo county lines. The yellow spot is of parcel 092-401-011, the main parcel that the project site is located on.
**Existing Site Conditions**

**Current and Historic Use**
The Santa Maria Refinery was built in 1955 by Union Oil and has been operating in its current location for nearly 60 years. The site is much larger than that has historically been used. The site is 1,780 acres but throughout the lifetime of the refinery only about 200 acres has been used for the refinery. The remaining 89% of the site is used for cattle grazing, preservation areas for wildlife, or held as open space. The refinery processes roughly 44,500 barrels of crude oil per day and its primary role is to convert heavy crude oil into a high-quality feedstock to be processed further into gasoline, diesel, and jet fuel. The initial heavy crude oil is brought to the refinery via a pipeline from suppliers in the Central Coast region. The feedstock produced from that crude oil is sent in another pipeline for finishing at a facility in Rodeo, CA. The refinery will continue to operate in its current form until its closure in 2023 and the site is zoned as industrial.

**Planning Area**
The site for the Santa Maria Refinery resides on the Nipomo Mesa and falls under the planning jurisdiction of the San Luis Obispo County Department of Planning and Building. However, given the proximity of the site to the Oceano Dunes State Vehicular Recreation Area, Pismo State Beach the coast, environmentally sensitive habitat area, proximity to HWY 1 and Little Oso Flaco Creek there will be a host of regulatory agencies and stakeholders involved in the decision-making process for this site. Included in this list (other than the county) is the California...
Department of Parks and recreation, the California Coastal Commission, Cal Trans, Central Coast Economic Recovery Initiative, Cal Poly Institute for Climate Leadership and Resilience, and the Oceana Economic Development Council.

**Land Use/ Combining Designations/ Zoning**

Another unique feature of the site is the surrounding land use designations. While the site is zoned as industrial, the surrounding land uses feature environmental sensitive habitat, residential, open space, and agriculture. As seen in the figure below…

**Site Access**

Due to its location out in the dunes the site is not very easily accessed. Further, the existing rail and road corridors limit access for moving materials to and from the site and may have contributed to the lack of economic feasibility surrounding the refinery. In 2017 the San Luis Obispo County Board of Supervisors denied a rail spur project that Phillips 66 had applied for that would have allowed the refinery to increase production and transport 6.6 million gallons of crude oil by rail per week.

![Figure 2.3. Another site map of the project in reference to nearby parcels and Highway 1.](image)

As can be seen in this map above, Highway 1 is the only major road within the vicinity of the site rendering it not easily accessible. The section of HWY 101 in this part of the Central Coast cuts much further inland than where the refinery is located, and State Route 166 or other surface streets must be used to access HWY 1.

**General Environmental Conditions**

While the site is surrounded by environmentally sensitive habitat area, the industrial history of the site has created various impacts on the environment. One area in particular that has been impacted is the local water table. The Santa Maria Refinery gets its water from the Nipomo
Mesa Management Area of the Santa Maria Groundwater Basin. There are known crude oil derived contaminants in the shallow aquifer, and remediation is being done to address these, but there is also a need to investigate the possibility of contaminants in the deeper aquifer as well. Soils on the site have also been contaminated with crude oil derived contaminants and Phillips 66 will be responsible for these remediations as well.

2.2 Project Objectives

The project objectives are multifaceted, aiming to address issues in the San Luis Obispo County region spanning from socioeconomic resource issues to environmental issues. This report will identify the environmental constraints associated with all phases of the project after remediation of the site, which is to be completed by the applicant. Specific objectives are as follows:

- Mitigate the impacts of the COVID-19 pandemic on the Central Coast region through economic recovery plan that focuses on clean energy investment, sustainable tourism, and creation of jobs.
- Increase resilience of local economy to withstand future economic shocks through strategies that seek to make the regional economy more economically and environmentally resilient and diverse.
- Utilize the untapped potential of talent and resources in local community through collaboration and inter-agency partnerships.
- Work to resolve the water supply issues of the region through desalination of ocean water.
- Reduce stress on groundwater basins in the region by providing an alternative water source.
- Remediate former refinery site and repurpose refinery facility.
- Preserve habitats and ecosystems located within the project site, as well as the nearby Environmentally Sensitive Habitat Area (ESHA), Oso Flaco Creek, freshwater lakes, and Pismo Dune area.

2.3 Project Phases

This section provides a general overview of the major phases that would be required to repurpose the existing project site and develop and operate a desalination facility. The three primary phases include refinery decommissioning and remediation, desalination plant construction and operation, and environmental restoration. An additional step for project funding, design, and approval would occur before the desalination plant could be built; however, this report will focus on the phases that will affect the physical, biological, and chemical properties of the site. A generalized project schedule is included in Table 2.1: Preliminary Project Timeline.

Table 2.1. The Victoria desalination plant project timeline summarized into years and main activities. From Victoria State Government.

<table>
<thead>
<tr>
<th>Year</th>
<th>Main activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Feasibility study completed</td>
</tr>
</tbody>
</table>
### Phillips 66 Santa Maria Refinery Decommissioning and Remediation

Before any new development can occur on the Project site, the existing Phillips 66 Santa Maria Refinery facility must be decommissioned and remediated. Historically, oil refinery locations have been found to carry large deposits of coal and petroleum in their soils long after the refineries are closed. It is also important to note that groundwater is historically known to be contaminated by oil refineries. Currently, the US EPA has the Phillips 66 Santa Maria Refinery site location listed as one of the locations in their “Cleanups in My Community” and the groundwater migration action is currently listed as “Not Controlled”\(^1\). This location may potentially need remediation for groundwater resources as well and another preliminary study to analyze the current existing conditions of the groundwater should be performed.

Decommissioning plans need to be prepared and executed alongside environmental permitting authorizations. Planning, engineering, environmental studies and compliance, removing piping, removing platforms, and disposing of waste are major steps in decommissioning an oil refinery (NES Fircroft\(^2\)). For the purposes of this analysis, it is assumed that the decommissioning and remediation process would be completed by the current owner of the property. Addressing the potential environmental impacts associated with the decommissioning and remediation phase is outside of the scope of this report.

### Desalination Plant Construction and Operation

Construction and operation of the proposed desalination plant would occur entirely within the existing 183.6-acre refinery facility footprint located on Assessor Parcel Number (APN) 092-401-011 and APN 092-401-005. The location of support infrastructure (e.g., pipelines, transmission lines, etc.) is unknown at this time and should be designed based on the results of the constraints analysis.

The phase of construction is likely the most costly and time consuming phase. Construction is broken up into repurposing the existing site for the desalination plant and upgrading infrastructure. Due to the differences between an oil refinery and a desalination plant, it is assumed that none of the existing facilities would be reused other than the roads. The pipelines,

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utilities, and electrical services that would accommodate the desalination plant do not match the facilities currently in use by the Phillips 66 Santa Maria Refinery. The current roads would be used for construction of the new desalination plant as well as be re-used for access to and from the plant when it is fully opened.

New infrastructure would consist of pipelines, buildings, filtration systems, pumping stations, and waste treatment. Additional details regarding the infrastructure required for a desalination facility is included in the “Desalination Plant Components” section below. In addition, due to the increased need for electrical power, it is assumed that the construction phase would include the development of new transmission lines and other required infrastructure upgrades.

**Ecological Restoration**

Another key phase of the proposed project involves the ecological restoration of the remainder of the Phillips 66 property located outside of the current facility footprint. This includes approximately 1,645 acres located on the following APNs: 091-141-062, 092-391-034, 092-391-020, 092-391-021, 091-192-034, 092-401-005, 092-401-011, 092-401-013, 092-411-005, and 092-411-002.

Restoration efforts will be directed towards improving the environmental and ecological condition of the degraded dune habitat and the degraded Little Oso Flaco Creek. Restoration efforts can take a variety of years based on the ecosystem being restored, the goal of restoration, and the funding and support for the restoration. For the project site, restoration would occur after the majority of the infrastructure was built and would continue for several years to account for ongoing monitoring and adaptive management measures.

### 2.4 Desalination Plant Components

The proposed desalination plant is recommended to be constructed on the 200 acres (of the 1,780-acre property) currently occupied by the Phillips 66 Santa Maria Refinery campus as to avoid occupying any undisturbed land or habitats. This section will provide an overview of the typical components of a seawater reverse osmosis (SWRO) desalination plant. Reverse osmosis is a widely employed water purification technology and is the leading process for desalination. Reverse osmosis uses applied pressure to induce water permeation through a semipermeable membrane while omitting salts. This process uses less energy than most thermal distillation technologies. This process also requires extensive pretreatment to prevent critical failure of the membrane during operation.

Desalination plants can vary significantly in size, based on desired output. For reference, the largest desalination plants in California are found in Carlsbad and Huntington Beach. Both facilities were designed to produce 50 million gallons per day (MGD) or 56,000 acre-feet per year (afy) of potable water. The Carlsbad beach desalination facility occupies a 4-acre parcel. The Huntington Beach plant spans 11 acres.

Due to the lack of project design details or guidelines, this report provides three options for possible desalination plant sizes, production amounts, and energy consumption values (refer to Table 2.2: Typical Desalination Plant Size) based off California water trends and residential
energy consumption data. The actual size of the desalination plant will be decided by the stakeholders and based on local limiting factors such as available industrial zoning space, energy consumption, amount of water produced, and is that water enough to supply an appropriate amount of community members.

Table 2.2: Typical Desalination Plant Size

<table>
<thead>
<tr>
<th>Water Production Supply (Daily Average)</th>
<th>Community Household Supply (Daily Average)</th>
<th>Energy Consumption by Plant (Daily Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 million gallons</td>
<td>375,000 gallons</td>
<td>405 mwh (megawatt hours)</td>
</tr>
<tr>
<td>50 million gallons</td>
<td>625,000 gallons</td>
<td>675 mwh</td>
</tr>
<tr>
<td>80 million gallons</td>
<td>1,000,000 gallons</td>
<td>1,060 mwh</td>
</tr>
</tbody>
</table>

The following paragraphs provide additional details regarding the typical components required for the construction and operation of a SWRO facility (refer to Figure 2.4: Example SWRO Facility Schematic).

![SWRO Facility Schematic](https://energycentral.com/c/ec/desalination-and-energy-consumption)

**Figure 2.4: Example SWRO Facility Schematic**

**Intake System**

The first step in a desalination treatment plant is the intake of ocean water and delivery to the plant. The intake location and type can vary - onshore intake, offshore intake, deep-water intake, and sub-seafloor intake are all potential options. The use of beach wells would substantially increase the risk of seawater intrusion into the regional groundwater basin. The inflow structure is subject to regulation by the EPA due to potential impacts to aquatic wildlife. The proposed solutions to these potential impacts include withdrawing water at such a rate as to

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3 https://energycentral.com/c/ec/desalination-and-energy-consumption

4 https://www.filtnews.com/reverse-osmosis-for-desalination/
allow wildlife to escape the intake structure or locating the intake structure outside areas of high biological productivity.

For the purposes of this analysis, we are assuming that an offshore intake pipeline would be installed along with an onshore pumping station located at the plant facility. This would allow the plant operators to control the speed of the pumping and the quantity of water being pulled through the intake system. A gate valve can be built to control the flow and a screening system can be installed to remove larger particles. For example, at the Sydney Desalination Plant, a drum screen filters out particles that are 3 millimeters or more in diameter. The Sydney plant has their offshore structure 300 meters offshore with intakes resting on the ocean bed 25-30 meters below the surface. The intake rate is very low in order to not harm the nearby wildlife and they also built artificial reefs around the intakes.

It is assumed that the construction of the pipeline would be completed through one of the three trenchless methods: horizontal directional drilling (HDD), micro-tunneling, or auger boring. HDD requires that a pilot hole be created and once complete it is enlarged to fit the pipeline by “prereaming” it. The pipeline is then attached to the reamer which is connected to the drill string. A drilling rig is then used to pull the attached reamer and pipeline to the other side. Installing a pipeline via the micro-tunneling method encompasses utilizing “a remotely controlled micro-tunnel boring machine combined with the pipe jacking technique.” The auger boring method creates a bore hole using a rotating cutting head. HDD and micro-tunneling can lead to hydro-fracturing while auger boring has limitations on accuracy and where it can be used.

**Pretreatment Facilities**

Pretreatment is the first stage of the desalination process. When seawater arrives at the plant, it goes through a pretreatment process to remove particulates, debris, microorganisms, suspended solids and silt from the source seawater prior to reverse osmosis separation. In actuality, however, pretreatment systems remove most but not all of the suspended solids contained in the seawater. The suspended solids, particulates and silt that remain after pretreatment accumulate on the surface of the RO membranes and cause loss of membrane productivity over time. In addition, because seawater naturally contains bacteria as well as dissolved organics, a biofilm of bacteria can form on the membrane surface.

Two types of pretreatment systems are typically used to protect the SWRO membranes from fouling: conventional granular media filtration and membrane filtration. Currently, conventional granular media filtration is the predominant pretreatment technology for large and medium size desalination plants. In this process, seawater is pumped into multimedia filter tanks, which typically include layers of anthracite and sand atop a bed of gravel (refer to Figure 2.5: Conventional Granular Media Filtration). The filtered material is then separated out and pumped back to the ocean.

Before seawater enters the reverse osmosis filters to remove the salt particles, it must go through a second stage of pretreatment called microfiltration to remove smaller (oftentimes microscopic) impurities. At this point, virtually all impurities other than dissolved salts and minerals have been removed from the water, but it still needs to go through one more step to

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5 Carlsbad Desal Plant EIR, From the Biological Resources Section Ch 4.3 p.18 (https://www.carlsbadesal.com/eir.html)
6 https://www.waterworld.com/home/article/16199151/seawater-pretreatment-challenges-and-considerations
remove the dissolved salts and minerals to be ready for drinking. Once filtered, the water moves into the next stage of desalination.

![Conventional Granular Media Filtration](image1)

**Figure 2.5: Conventional Granular Media Filtration**

### Reverse Osmosis Treatment Facilities

The RO treatment is the center of the desalination process. RO systems leverage a semi-permeable membrane to remove ions, molecules, and unwanted contaminants and particles (salt in the case of desalination) from water. Reverse osmosis works by pushing water – under intense pressure – though semi-permeable membranes to remove dissolved salts and other impurities (refer to Figure 2.6: Example Pressure Vessel). High pressure pumps carry the water through the membranes. Much of the energy expended by the high-pressure pump is not used. Thus, an energy recovery device can be installed to reduce the total energy demand by 30%.

![Example Pressure Vessel](image2)

**Figure 2.6: Example Pressure Vessel**

These membranes act like microscopic strainers that allow only water molecules to pass through, leaving behind the salt, minerals and other impurities such as bacteria and viruses. At the Tampa Bay Seawater Desalination Facility, the membrane pore size is 0.001 microns or

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7 [https://www.carlsbaddesal.com/how-it-works.html](https://www.carlsbaddesal.com/how-it-works.html)
At the Sydney Desalination Plant, there are 8 membranes per pressure vessel with a total of 36,000 membranes installed in the system (Sydney Desalination Plant). The size of the RO facilities will vary greatly depending on the water production capacity of the facility. For example, the Carlsbad Desalination Plant RO building contains more than 2,000 pressure vessels housing more than 16,000 reverse osmosis membranes.

**Post Treatment Facilities**

After the RO process, water typically undergoes chemical conditioning in product water post treatment facilities. Lime and carbon dioxide are used for post-treatment stabilization. The water then goes through a process called chloramination where chlorine is added in the form of ammonia and sodium hypochlorite to disinfect the water to the standards of the local health services standards.

**Product Water Storage**

Once the desalination process is complete, the water moves to storage tanks before being pumped to local water purveyors and blended with the regional water supply.

**Chemical Storage and Handling Facilities**

A wide range of chemicals are used extensively in the desalination and water treatment business. Substances used typically falling into one of two main groups. The first group, known as ‘online’ chemicals, includes coagulants, flocculants, chlorination and de-chlorination agents and biocides. The second group, often called ‘offline’ chemicals, includes a large number of somewhat stronger chemicals that can be used for a variety of purposes such as dissolving the fouling that attaches to filtration membranes during operation.

Typically, various chemicals associated with the desalination process are stored on site. Some commonly stored chemicals include sodium hypochlorite, sodium hyroxide, sodium tripolyphosphate, sodium dodecylbenzene ammonia, lime, ferric sulfate, citric acid, and sulfuric acid. Chemicals must be stored in accordance with Federal, State, and local standards.

**Concentrate Management**

High levels of Total Dissolved Solids (TDS) concentrates (>65,000 mg/L) are produced by RO plants, which may also contain some toxic chemicals used during feedwater pretreatment and post-treatment. The concentrate from desalination (often referred to as brine) varies in composition and volume depending upon the nature of the source water. This makes Concentrate Management necessary to prevent significant environmental impact. Selection of management strategies depends on several factors: the concentrate volume and quality, the location of the desalination plant, and the pertinent environmental regulations. The following paragraphs explore examples of concentrate management practices often used, along with the benefits and drawbacks of each, then give recommendations based on the site specifics. The

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8 https://www.tampabaywater.org/tampa-bay-seawater-desalination
most used options are surface water discharge, submerged disposal, sewer disposal, deep well injection, land application, evaporation pools, and zero liquid discharge (Handley\textsuperscript{10}).

**Surface Water Discharge.** This method involves disposing the concentrate in waterways adjacent to the plant including tidal rivers and streams, oceans, estuaries, or bays. Environmental concerns include long-term effects on the water quality of coastal aquifers and adverse impacts on the receiving waters’ ecosystems.

**Submerged Disposal.** In this method the concentrate is transported away from the desalination plant via underwater pipes to an estuarine and/or ocean location. Environmental concerns include potential impact of sinking briny concentrate on benthic marine organisms living on the sea bottom.

**Deep Well Injection.** Deep well injections greatly depend on the geological setting. For example, a porous layer and aquifer would be required near the site. Additionally, construction of deep injection wells can be costly. Depths vary among areas on how deep the well would need to go. An EPA permit is required to verify the well would be stable for injection. Lastly, groundwater quality could be impacted due to injection.

**Sewer Disposal.** Sewer disposal is a relatively inexpensive and straightforward disposal option. The liquid waste would be sent to a treatment plant used by the area. Options with this include concentrate discharge to the front or the back of the wastewater treatment plant. Discharge to the front is not recommended as conventional wastewater treatments do not remove TDS, which can result in significant impact on the biological treatment process of the wastewater. Discharge disposal to the end of the wastewater treatment plant mixes with the treated wastewater, resulting in a diluted concentrate. Drawbacks to this option include the cost of constructing an additional pipeline (and possibly a pump) connecting the two separate plants, as well as the possibility of adversely impacting receiving water despite the dilution. This may be a viable option for concentration disposal, as the Santa Maria Wastewater Facility is nearby, directly 12.5 driving miles southwest of the proposed project site. Additional research into the impact of this process on receiving water is recommended. Correspondence with the wastewater treatment plant would also be needed to be assessed if the plant has the ability to integrate with the desalination plant.

**Evaporation Ponds** are another option, constructed with liners and allow water evaporation while the salts accumulate at the bottom of the pond. These ponds are cost effective and demand low energy input, but are best suited for arid regions, as moist air will decrease evaporation rates. The main problems with evaporation ponds is the large area needed to hold the substantial volumes of liquid. The ponds must be at a shallow depth to allow for evaporation, causing small volumes to be held even when using large areas. In recent years, technology has been developed to decrease the land area needed for ponds, which may be explored for the project site. Monitoring is essential for this process due to the exposure to wildlife. There is also a risk of groundwater contamination due to pool leakage.

**Land Application.** This method involves application of the concentrate to salt-tolerant crops or vegetation. Feasibility of this method depends on the local climate, land availability, location of the groundwater table, and vegetation tolerance to salinity.

**Brine Concentrators.** Technologies such as brine concentrators are relatively new but promise large scale minimization in brine discharge volumes by extending the range of RO filtering membranes to that of thermal evaporation. This process uses heat exchangers, deaerators, and vapor compressors to convert the traditional liquid concentrate produced to a more slurry, concentrated form. With this technology, brines can be concentrated up to 130,000 mg/L, which minimizes the total amount of brine being sent out for disposal. Downsides to this method including locating a disposal site for high concentrations of salts, ions, and chemicals and increased energy requirements to accomplish this methodology.

**Zero liquid discharge.** The zero liquid discharge method is another fairly new technology that employs an evaporation process to turn brine into a dry solid. This process would not be best suited for this project because it is extremely energy intensive, expensive, and pairs the best with thermal desalination technologies, not reverse osmosis.

The environmental constraints analysis section below will focus on the **submerged disposal** option for concentrate management. Reasons for this include:

- It is one of the most common methods in practice at other existing desalination plants
- Under the Desalination Amendment to the California Water Resources Control Board, if the toxicity levels in concentrated discharge are below recently established thresholds, submerged disposal would be considered acceptable with mitigation applied.

**Distribution**

The project will be designed to deliver freshwater for domestic consumption, landscaping, agricultural uses, and potentially ecological restoration of impaired local freshwater streams. The extent and location of distribution pipelines is unknown at this time and will not be included as part of the environmental constraints analysis.

**ECOLOGICAL RESTORATION COMPONENTS**

The ecosystems of the project site include coastal dunes, freshwater lakes, wetlands, and marshes. The ecosystems have similar threats from intensive recreation and invasive species. Restoration efforts will be directed towards improving the environmental and ecological condition of the degraded dune habitat and the degraded Little Oso Flaco Creek. The primary components of the ecological restoration phase are outlined in the paragraphs below.

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**References**

https://semspub.epa.gov/work/01/554360.pdf
https://www.co.monterey.ca.us/home/showdocument?id=52448
https://www.fws.gov/refuge/Humboldt_Bay/wildlife_and_habitat/DunesRestoration.html
https://www.nps.gov/pore/learn/management/planning_dunerestoration.htm
https://books.google.com/books?hl=en&lr=&id=VHaA1I4Rd_YC&oi=fnd&pg=PR7&dq=dune%20habitat%20restoration&ots=J94P-
clvnQ&sig=3kZsGUEUfQJBRisRxl5rothVLSo#v=onepage&q=dune%20habitat%20restoration&f=false
Dune Habitat Restoration

Dune restoration typically begins with the removal of over-stabilizing invasive vegetation. In many cases, that action alone is sufficient to return the system to the point where native species can recolonize, and communities can recover. In other cases, more intensive intervention is needed. Often in these cases, fencing will accompany the planting of native species. Sand fences help promote effective dune formation. All dune restoration efforts will measure success with regular monitoring and maintenance.

Little Oso Flaco Creek Restoration

The USDA Guidance for Stream Restoration lists nine steps for a successful a restoration effort.

- Identify problems and opportunities
- Determine overall goals and specific objectives
- Inventory resources
- Analyze resource data
- Formulate alternatives
- Evaluate alternatives
- Make decisions
- Implement the plan
- Evaluate the plan

There are numerous strategies for effective stream restoration. Different methods are useful for remedying different issues. In the case of Little Oso Flaco Creek, a study from the Coastal San Luis Resource Conservation District recommended biofiltration methods appropriate for farming activities and soil types. These methods include:

**Filter Strips.** A filter strip is an area of grass or other permanent vegetation used to reduce sediment, organics, nutrients, pesticides, and other contaminants from runoff and to maintain or improve water quality.

**Vegetated Waterways.** A vegetated waterway is a constructed channel that is shaped or graded to the required dimensions and established in suitable vegetation for the stable conveyance of runoff. It conveys runoff without causing erosion or flooding and improves water quality.

**Vegetated Retention Ponds and Basins.** Vegetated retention ponds and basins are meant to collect stormwater and slowly release it at a controlled rate so that downstream areas are not flooded or eroded.
3 Stakeholder Analysis

Stakeholders determine if a project has enough support from important interest groups, government departments, and local authority councils to be set into motion. If the project has enough support, in general, the stakeholders must then compromise on certain issues, since many of the interested parties have differences of opinions. There are internal stakeholders and external stakeholders which each have their own authority and preferences. Here are the stakeholders for the proposed desalination facility at Phillips 66 Santa Maria Refinery, as well as their areas of interest and their potential contributions to the proposed project discussion.

Table 3.1 Lists the various stakeholders for the project in alphabetical order. The area of concerns and the role of the stakeholder are identified for clarity.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Area of Interest/Concern</th>
<th>Potential Role/Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Cattlemen’s Association(^{12})</td>
<td>This group is interested in the cattle grazing area surrounding the functional 200-acre refinery. They would more likely want the amount of grazing land to stay the same.</td>
<td>They would most likely be in debate about how the extra ground is being used, and how big the new desalination facility should be. They will argue that the use of cattle helps keep invasive species at bay and protect the native plant and animal species.</td>
</tr>
<tr>
<td>California Department of Fish and Wildlife(^{13})</td>
<td>They are concerned with the water quality in the ocean and surrounding streams as many native species of fish inhabit those areas. The wildlife preservations will want to be kept as well. They will also be concerned with noise as it can disrupt certain animal species behavior patterns.</td>
<td>They will argue that water quality is a top priority and that the wildlife areas should stay protected. They will most likely work with other departments and interest groups. They will most likely set a requirement for how much noise is allowed during certain times of the day.</td>
</tr>
<tr>
<td>California Department of Forestry and Fire Protection(^{14})</td>
<td>This group is interested in the safety regulations for the proposed facility in case of a fire. They are also interested in how the project will ensure fire protection, including controlled burns, limiting brush vegetation, and having water access.</td>
<td>They could possibly agree or disagree with the California Cattlemen Association, depending on how the group views the potential hazards of cattle grazing.</td>
</tr>
<tr>
<td>California Department of</td>
<td>This group is primarily focused on air quality, aesthetics, noise, biological</td>
<td>This group will want to limit the amount of noise, whether time of day, loudness, or duration of the noise. They will also want</td>
</tr>
</tbody>
</table>

\(^{12}\) California Cattlemen’s Association (2021). Retrieved on April, 19, 2021 from [https://calcattlemen.org/](https://calcattlemen.org/)

\(^{13}\) California Department of Fish and Wildlife (2021). Retrieved on April 19, 2021 from [https://wildlife.ca.gov/](https://wildlife.ca.gov/)

\(^{14}\) California Department of Forestry and Fire Protection (2021). Retrieved on April 19, 2021 from [https://www.fire.ca.gov/](https://www.fire.ca.gov/)
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<tr>
<th>Stakeholder</th>
<th>Area of Interest/Concern</th>
<th>Potential Role/Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks and Recreation</td>
<td>resources, and water quality.</td>
<td>to make sure that the air quality with improves or remains the same as many tourists come to this area to enjoy the surrounding sand dunes.</td>
</tr>
<tr>
<td>California Department of Transportation</td>
<td>They will want to preserve the function of the roads to and from the proposed facility as well as the nearby Union Pacific Railroad.</td>
<td>They will not contribute a large amount to debate and discussion, unless their roads are being heavily altered or there is a proposed change in the railroad tracks.</td>
</tr>
<tr>
<td>California Public Utilities Commission</td>
<td>This group is focused on how the change in facility purpose from mining oil to desalinating oceanic water will impact the energy sector of the area. They will also be interested in how the facility will impact the railroad.</td>
<td>Their one requirement will be that the railroad isn’t impacted and that the trains can fully function with the new facility.</td>
</tr>
<tr>
<td>Central Coast Regional Water Control Board</td>
<td>They will water the majority, if not all, of the water obtained from the facility to stay in the central coast regions of the state. They won’t want the water to spread out to different areas.</td>
<td>They will most likely debate the State Water Resources Control Board on the allocation of the water.</td>
</tr>
<tr>
<td>City of San Luis Obispo</td>
<td>The city will be interested in job loss, aesthetics, noise, biological resources, water quality, and water distribution.</td>
<td>This groups interests and concerns are very broad and wide-ranging, but they will mostly give their support of the project if the water from the plant goes directly to the city and only the immediate surrounding areas.</td>
</tr>
<tr>
<td>City of San Luis Obispo Planning Commission</td>
<td>This group will be interested in how the facility will promote jobs as well as be in accordance to building codes.</td>
<td>They will not have a great importance in how the proposed project deals with its issue areas.</td>
</tr>
<tr>
<td>Friends of Oceano Dunes</td>
<td>This group will most likely be concerned with the</td>
<td>They will push for the aesthetics and physical beauty of the area to either</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Area of Interest/Concern</th>
<th>Potential Role/Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetics, noise, and air quality from the desalination plant. These potential issues could negatively impact the productivity and tourism of the Oceano Dunes and recreation.</td>
<td>remain the same or improve in quality. They won’t want large disruptive noises or any air pollution, as many people who come to ride dune buggies in the area expect clean, clear, and fresh air.</td>
<td></td>
</tr>
<tr>
<td>Get Oil Out!22</td>
<td>This Santa Barbara interest group extends into surrounding counties. They would be in favor of the removal of the refinery and approve the desalination plant, if the wastes from desalination don’t pollute the surrounding waterways and ocean.</td>
<td>They would possibly donate to the project to make sure that there isn’t water pollution. They are more likely to donate to the efforts since the refinery is getting replaced by a desalination facility.</td>
</tr>
<tr>
<td>National Marine Fisheries Service23</td>
<td>This group will be concerned with the state of the oceanic water and if the same nutrients and materials are there to sustain marine life and fisheries. They will also be concerned that changes in the water will not impact local fishing industries.</td>
<td>This group will push for economic stability for the local fishery industry as well as control monitoring and mitigation of marine life.</td>
</tr>
<tr>
<td>Native American Groups (Maidu, Chumash, and Yokut)24</td>
<td>The native American tribes will have concerns over the extra use of land. They will also have concerns about where the hazardous waste from the desalination process will be going, since, historically, waste has been placed on native American lands.</td>
<td>These groups will most likely push for the 1,780-acre plot of land to be partially distributed back to the native American tribes in the area. They will also require that no desalination waste is placed on their lands.</td>
</tr>
<tr>
<td>Oceano Beach Community Association25</td>
<td>They would be concerned with the loss of the 140 full-time employees at the refinery and how those jobs would be replaced. They</td>
<td>They will contribute a lot to debate and discussion. They will most likely want a job allocation program for the job loss. They will want little to no disturbance in the current oceanic scenery. Air and</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Area of Interest/Concern</th>
<th>Potential Role/Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceano Economic Development Council(^{26})</td>
<td>would also be concerned with air and water quality, noise, and aesthetics.</td>
<td>water quality would either need to stay the same or improve.</td>
</tr>
<tr>
<td>Phillips 66 Santa Maria Refinery(^{27})</td>
<td>This group is primarily interested in the job loss from the refinery and how the desalination facility would handle hiring people for the plant.</td>
<td>The group will most likely propose a job mitigation plan that uses the same employees to operate the machinery for the new facility.</td>
</tr>
<tr>
<td>State Water Resources Control Board(^{28})</td>
<td>The refinery has already decided to stop production in 2023, so there isn’t an issue of if the refinery is being shut down.</td>
<td>They will not have a substantial contribution.</td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers(^{29})</td>
<td>They will be concerned how exactly the proposed facility will dispose of the waste, and most importantly, where the fresh and desalinated water will be distributed in the surrounding areas.</td>
<td>The board may push for the water obtained from the facility to be spread further around the state to target areas with more severe water shortages, like San Diego, Los Angeles, or Riverside counties. They will most likely debate with the Central Coast Regional Water Control Board for allocation.</td>
</tr>
<tr>
<td>U.S. Coast Guard(^{30})</td>
<td>This group is mostly concerned with how the proposed facility will be made and will make sure that everything sustains the proper coding and safety regulations.</td>
<td>This group will not debate much, but they will offer their time and guidance in the planning and building process of the facility.</td>
</tr>
<tr>
<td>US Department of Agriculture: Forest Service(^{31})</td>
<td>The project setting has 1,780 acres, with only 200 being of previous operational use. The remaining acres were used.</td>
<td>They will contribute guidance, consultations, and possibly funds to the protection of the species and habitat. They could push for more wildlife preservation grounds in the 1,780-acre area.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Area of Interest/Concern</th>
<th>Potential Role/Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Fish and Wildlife Service32</td>
<td>This group will have a very similar interest to the state fish and wildlife department. They are concerned with the water quality in the ocean and surrounding streams as many native species of fish inhabit those areas. The wildlife preservations will want to be kept as well. They will also be concerned with noise, as it can disrupt certain animals mating and behavioral patterns.</td>
<td>They will argue that water quality is a top priority and that the wildlife areas should stay protected. They will most likely work with other departments and interest groups. They will also make sure that the proposed project and facility follows all federal ecological laws under the U.S. Fish and Wildlife Service. They will argue that noise must be kept to minimum and will most likely set a certain decibel level of excepted noise.</td>
</tr>
</tbody>
</table>

---

4 Environmental Constraints Analysis

4.1 Methodology
A desktop analysis was performed to determine potential environmental constraints associated with the conversion of the Phillips 66 Santa Maria Oil Refinery into a reverse osmosis desalination plant. Criteria from Appendix G of the California Environmental Act (CEQA) Guidelines was used as a framework to decide if there are any potentially significant impacts on four different resource areas. Through this process, we determined if any further federal, state, or local permitting measures were needed for each area. The resources areas evaluated include the following:

- Hydrology and Water Quality
- Biological Resources
- Air Quality
- Aesthetics

The results of this analysis and the summary of environmental constraints are provided throughout the environmental constraints analysis section. A desktop review was conducted to assess potential issue area constraints which included collecting data on special-status species, vegetation communities, sensitive communities, protected lands, and federally protected aquatic resources with the potential to occur within the project area. Furthermore, a preliminary review of recent ariel imagery and land use maps was conducted to collect site-specific information regarding habitats for special-status species, protected lands, and the relative location of the project site to nearby residential, commercial, and recreational areas. This data was gathered from the San Luis Obispo County open data site and GIS services site.

A search conducted through the USFWS’s iPaC system was performed to identify a list of federally listed species that may occur in or adjacent to the project area. To identify designated critical habitats near the project area, a search was conducted through the USFWS’s Critical Habitat portal. A query of the USFWS’s National Wetlands Inventory was performed to identify aquatic resources that has the potential to be affected by the proposed project. Lastly, the CNPS database was searched to identify special-status plant species with the potential to occur in or nearby the project area.

4.2 Hydrology and Water Quality

4.2.1 Issue Area Description
This section addresses the existing resource conditions involving hydrologic and water quality resources. The hydrology and water resource issue area examines the site’s current water resources, water quality, and waste discharge standards set by the Central Coast Regional Water Quality Control Board (CCRWQCB). Groundwater and subsurface flows are not potentially impacted by the completion of this project and therefore will not be discussed.

Site Description
The project site that is being proposed for conversion from the oil refinery into a desalination plant sits about even with sea level, about 2.5 miles away from the Pacific Ocean, and has a network of pipes that could pose potential threat to groundwater. Other surrounding land uses
consist of industrial and residential areas to the east of the site. Much of the refinery site being utilized by company operations is a combination of asphalt and concrete surfaces with some compacted dirt and gravel roads.

The site is positioned by the Oceano Dunes as well, which is a Sensitive Habitat area as well as a recreational vehicle area. The land from the refinery is industrially zoned in land parcel is in 092-401-01. This land parcel is contained within the California Coastal Zone and Flood Hazards Area (San Luis Obispo Planning and Building Department, 2016). Since it is a Coastal Zone, it is regulated by the California Coastal Commission, and it reaches 5 miles inland from the shore. Since it is also a designated Flood Hazard Area, this area has the potential to be inundated by a 100-year flood although the flood risk is deemed to be of low potential.

In 2016, a leak was noticed during replacement of the line carrying oil and contaminated a groundwater plume extending 3.7 acres and reaching depths of up to 70ft. Although there is no immediate human health impact, this poses a potential significant impact to development of the area.

The average precipitation of San Luis Obispo County is about 20 inches over the course of around 50 days per year. Depending on the time of year this project would be constructed, rainfall could prove to be an agent for increasing impacts of runoff carrying sediment or other chemicals into waterways and drainage.

No slopes within the proposed project site have a slope that is above 30%, however in the Oceano dunes, there are slopes that do have a higher slope than 30%. The elevation of the project site also sits at about sea level with some elevations around 150ft. Due to the changing landscapes of the dunes, the formation of small lakes occurs. There are a numerous number of lakes that have been formed in the area and the ones of highest interest are the Osos Flaco lakes. Seen in Figure 4.2, the Oso Flaco Lakes and Creek are seen in close relation to the project area.

The Oso Flaco Creek Watershed is included within the watershed of interest, the Nipomo Mesa Area of the Santa Maria watershed. The watershed is a low sloping, sandy soiled, and has a high amount of runoff pesticides. This area is also highly prone to erosion from wind. The Oso Flaco Creek is primarily a drainage creek that flows into Little Oso Flaco Lake. Little Oso Flaco then flows into another section of creek and finally settles in Oso Flaco Lake.

**Existing Water Quality Conditions**

According to the Central Coast Ambient Monitoring Program (CCAMP), this watershed is one of the most polluted watersheds in the Central Coast. This is due to high concentrations of nitrate from adjacent agricultural practices. Under the EPA’s 303(d), each one of these Oso Flaco waterbodies are classified as impaired waters and are designated by the Department of Water Resources of the Central Coast. CCAMP has also monitored several other pollutants found in the water bodies. The pollutants include: unionized ammonia, chloride, fecal coliform, nitrate, orthophosphates, chlorpyrifos, diazinon, and DDT.

Oso Flaco Lake is the largest body of freshwater in close adjacency to the project site and is also the largest lake in the Nipomo Mesa. Oso Flaco and Little Oso Flaco Lake are regulated by the California State Parks and Recreation Department of the Oceano Dunes District. Both lakes
maintain a steady flow of agricultural runoff and have minimal discharge rates. Due to their capacity, these bodies also maintain a high level of suspended sediment on rainy days.

Due to high contamination rates of sediment and runoff being collected in these lakes, drainage patterns of the proposed project are expected to be heavily influenced. The Phillips 66 Refinery already has a small Municipal Separate Storm Sewer System, as required by the county’s Stormwater Management Program. This system facilitates the treatment of stormwater that encounters surfaces located within the facility and empties into the Pacific Ocean.

**Threshold of Significance**

In Appendix G of the CEQA Guidelines for the Hydrology and Water Quality issue area, the following checklist points that pertain to the project are determined with the following questions.

Would the project:

a) Violate any water quality standards or waste discharge requirements?

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

f) Otherwise substantially degrade water quality?

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

j) Inundation by seiche, tsunami, or mudflow?
4.2.2 Potential Environmental Concerns

**HWQ 1** – The project could potentially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

The proposed project would include potential construction of additional impervious surfaces on the project site. This would increase the existing rates of surface water runoff that is generated from the site. The additional runoff produced from the proposed project would be incorporated and worked into the existing onsite drainage systems, which would not substantially increase the onsite or offsite flood risks. The construction and operation of the proposed project would develop surface runoff impacts related to short-term construction activities but would not substantially alter the existing drainage patterns and onsite systems of the project in the long term.

**HWQ 2** – The project potentially would create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Another potential risk associated with runoff during the construction phase of the project is increased sedimentation affecting drainage systems. However, the quantities of sedimentation produced from the project site construction activities will not cause substantial additional sources of polluted runoff, and any onsite or offsite sedimentation will be retained within the onsite drainage systems.

**HWQ 3** – The project would alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.

The short-term construction activities of the proposed project will result in less than significant impacts of onsite erosion with incorporated mitigations. The new infrastructure of the proposed project would require building new facilities, filtration systems, waste treatment, and pipelines. Construction related activities have the potential to produce runoff that would impact the existing drainage pattern of the site, resulting in some impacts of erosion that can incorporate mitigation. The runoff will be retained within the proposed project site and incorporated in the existing onsite drainage patterns.

**HWQ 4** – The project could potentially otherwise substantially degrade water quality such as impacting salinity levels of marine waters.

In the post project completion phase, the long-term effects of the Nipomo Mesa Desalination Plant Project include increasing the salinity of marine water due to brine discharge from the discharge pipelines. The storage of brine discharge also poses a challenge in the long-term upkeep of the site especially when regarding potential seepage dangers from the dryout tank of the plant. The long-term operation surface water runoff flows would be incorporated in the existing drainage systems and onsite treatment processes.
4.2.3 Recommendations

**HWQ 1** - The project could potentially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

Prior to construction of the intake and discharge pipelines from the desalination plant, the Central Coast Water Quality Regional Control Board should file a Notice of Intent (NOI) with the State Water Resources Control Board and prepare and implement a Stormwater Pollution Prevention Plan to minimize runoff and potential flooding impacts during construction activities. Along with the filing of the NOI, the Central Coast Water Quality Regional Control Board should coordinate with the San Luis Obispo County Sanitation Department regarding existing drainage systems that receive surface water runoff coming from the proposed project site and participate in the improvements of the drainage, if necessary, to accommodate surface water runoff.

**HWQ 2** - The project potentially would create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Prior to construction of the intake and discharge pipelines from the desalination plant, the Central Coast Water Quality Regional Control Board will file a Notice of Intent (NOI) with the State Water Resources Control Board and prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) to minimize erosion and runoff impacts during. In addition to implementing a SWPPP, a list of Best Management Practices (BMP) would be provided to contain the site runoff within the project area for proper treatment. With the implementation of SWPPP and BMPs, the impacts would be less than significant.

**HWQ 3** - The project would alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.

Refer to HWQ 1. The SWPPP can be implemented to mitigate the potential onsite erosion from short-term construction activities along with BMPs to make improvements in the less than significant impacts from erosion.

**HWQ 4** - The project could potentially otherwise substantially degrade water quality such as impacting salinity levels of marine waters.

The impacts regarding marine water quality from the proposed project would be produced from the intake and outtake discharge pipelines. It is recommended that the pipelines are constructed so that there is adequate distance between intake areas and discharge regions to better balance the marine water quality. Additionally, BMPs and regular monitoring of the onshore and offshore marine waters will need to be implemented to ensure that water quality impacts are properly avoided or mitigated.
Figure 4.1: Bathymetric contours in 10 meter intervals of the coastal waters near the project site.
Figure 4.2: Map of the waterbodies and watershed boundaries near the project site. Data layers were obtained from the California Department of Fish and Wildlife and the SLO county GIS site.
4.3 Biological Resources

4.3.1 Issue Area Description

Existing Conditions

Terrestrial Ecosystems

The habitats found among the Guadelupe- Nipomo Dune complex is open sand, sand dunes, dune scrub, vegetation islands within the dunes, dune lakes, freshwater streams, coastal lagoons, wetlands, riparian habitats, and woodlands, plus some agricultural and developed areas (AECOM). Dunes can be broken into two groups of front dunes and back dunes. Front dunes face the ocean and have less vegetation due to stronger winds, storm waves, lack of freshwater, and salinity sprays. The back dunes have more vegetation due to less erosive and wind conditions (AECOM).

Open Space

The area surrounding the proposed project site, Nipomo Dunes, is designated, partially, as Open Space, where the area works as a buffer to protect the vegetation in the back of the dunes and the dune lakes. The buffer provides protection from the off-road vehicular use in the Oceano Dunes SVRA. The Nipomo Dunes is the largest dune complex in the State, as it stretches across the central Californian coast for 12 miles. Due to the dune’s unique environment, it supports a variety of numerous plants and animals, many of which are specifically adapted to the rare dune biome. The tall and dramatic dunes are highlighted in many government reports, both federal and state, for being an important natural resource and a symbol of California’s landform diversity.

Grazing Activity

Cattle grazing is not yet completely confined to area which does not impact wetland habitats. Grazing could allow for non-native, invasive species to out-compete for resources and harm the native, endangered species.

Vegetation

Vegetation is defined using the classification system described in *A Manual of California Vegetation, Second Edition* (Sawyer et al 2009). The classification consists of alliances which are used at a larger scale. Alliances group vegetation types into categories that are less specific and give a general idea of regional vegetation. The next level is associations which are more specific to the local space and combine plant species. For example, the dune scrub around the project area is broken into two alliances: Silver Lupine- Mock Heather Alliance and Dune Heather Alliance. Under the Dune Heather Alliance is three associations: Dune Heather and Black Sage Association; Dune Heather, California coffeeberry, and Blue elderberry Association; and the Dune Heather Seacliff Buckwheat, and Black Sage association (MRS). These associations include specific plants such as blue elderberry (*Sambucus nigra subsp. caerulea*), California coffeeberry (*Frangula californica*), poison-oak (*Toxicodendron diversilobum*), dune buckwheat (*Eriogonum parvifolium*), California croton (*Croton californicus*), coast horkelia (*Horkelia cuneata subsp. cuneata*), and California aster (*Corethrogyne filaginifolia var. Robusta*) (MRS).
Majority of the project area is covered by sand. About 2500 acres or 50% of the area is covered in sand that is too harsh for vegetation to grow. Most vegetation is concentrated in the back dunes, wetlands, and woodlands. These plants are adapted to harsh temperatures and salinity levels. The back dunes consist of alliances such as mock heather (*Ericameria ericoides*), silver dune lupine (*Lupinus chamissonis*), seaciff buckwheat (*Eriogonum parviflorum*), and dune ragwort (*Senecio blochmaniae*). Riparian vegetation is common around the Oso Flaco Lake, Little Oso Flaco Lake, and Pismo Lake (MIG).

The woodlands among the project area scattered and typically composed of non-native species. The main vegetation is eucalyptus (*Eucalyptus sp.*), and Monterey pine (*Pinus radiata*), although some native coast live oaks (*Quercus agrifolia*) can be found. Non-native species were purposely and accidentally introduced to the area. Weeds and invasive species such as European beach grass, perennial veldt grass, jubata grass, ice plant, Cape ivy, and Russian wheat grass were introduced in hopes of stabilizing the dunes. However, the plants dominant over native vegetation, growing higher than other plants and must be managed by local programs (MIG).

There is an estimated total of 1814 acres of native vegetation and 534 acres of non-native vegetation and/or agricultural vegetation. A table below displays the acreage of vegetation and other land coverage that affects vegetation levels (MIG).

*Table 4.1. A compilation of vegetative and land coverage acreage. Source: MIG, Draft Habitat Conservation Plan for the Oceano Dunes District.*

<table>
<thead>
<tr>
<th>Land Coverage</th>
<th>Acres</th>
<th>Percentage of Area</th>
<th>Native or Non-native</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetation Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver dune lupine-mock heather scrub</td>
<td>1079</td>
<td>21.56</td>
<td>Native</td>
</tr>
<tr>
<td>Arroyo willow thicket</td>
<td>370</td>
<td>7.39</td>
<td>Native</td>
</tr>
<tr>
<td>European beach grass sward</td>
<td>192</td>
<td>3.84</td>
<td>Non-native &amp; invasive</td>
</tr>
<tr>
<td>Dune mat</td>
<td>140</td>
<td>2.80</td>
<td>Native</td>
</tr>
<tr>
<td>Native wetland alliances</td>
<td>136</td>
<td>2.72</td>
<td>Native</td>
</tr>
<tr>
<td>Other non-native alliances</td>
<td>120</td>
<td>2.40</td>
<td>Non-native</td>
</tr>
<tr>
<td>Other native upland alliances</td>
<td>89</td>
<td>1.78</td>
<td>Native</td>
</tr>
<tr>
<td>Land Use Coverage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sand</td>
<td>2499</td>
<td>49.93</td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>134</td>
<td>2.68</td>
<td></td>
</tr>
<tr>
<td>Developed</td>
<td>86</td>
<td>1.71</td>
<td></td>
</tr>
<tr>
<td>Open water</td>
<td>72</td>
<td>1.43</td>
<td></td>
</tr>
</tbody>
</table>

**Animals**

The Guadalupe-Nipomo Dune complex is essential for food, habitat, and migratory purposes. 19 species of mammals, 19 species of fish, 28 species of reptiles and amphibians, and hundreds of species of birds can be found among the complex throughout the year (MIG). Birds such as willets (*Catoptrophorus semipalmatus*), marbled godwits (*Limosa fedoa*), sanderlings (*Calidris alba*), gulls (*Laridae sp.*), Brewer’s blackbird (*Euphagus cyanocephalus*) and white-crowned sparrow (*Zonotrichia leucophrys*) are found among the beaches. Other birds such as red-winged blackbirds (*Agelaius phoeniceus*), song sparrows (*Melospiza melodia*), great horned owl
(Bubo virginianus) and western meadowlarks (Sturnella neglecta) live among the dunes and vegetative areas. Deer mice (Peromyscus maniculatus) and black-tailed jackrabbits (Lepus californicus) can be found and serve as a food source for predators such as coyotes (Canis latrans), and bobcat (Lynx rufus) (MIG).

Riparian areas have migratory bird species, reptiles, and amphibians. Waterfowl include the Wilson’s warbler (Wilsonia pusilla), black phoebe (Sayornis nigricans), Pacific-slope flycatcher (Empidonax difficilis), northern rough-winged swallow (Stelgidopteryx serripennis), black crowned night heron (Nycticorax nycticorax), red-shouldered hawk (Buteo lineatus), and ornate shrew (Sorex ornatus). Amphibians such as the Pacific treefrog (Pseudacris regilla) can be found as well as reptile such as the western skink (Eumeces skiltonianus) and garter snake (Thamnophis sp.). Mammals that inhabit the area are the big-eared woodrat (Neotoma macrotis), opossum (Didelphis virginiana), raccoon (Procyon lotor), and gray fox (Urocyon cinereoargenteus) (MIG).

Freshwater creeks are important to fish, invertebrates, and amphibians. Fish such as rainbow trout (Oncorhynchus mykiss), steelhead trout, three spine stickleback (Gasterosteus aculeatus) and prickly sculpin (Cottus asper). Amphibians that utilize streams are western pond turtles (Emys marmorata) and western toad (Bufo boreas) (MIG).

Marine Ecosystems

Marine information is more limited at this time. The Oceano dunes border the Pacific Ocean. There are shallow marine deposits and sediments that run along the area. Deposits of Pliocene Careaga Sand have marine origin and contribute to dune structure. Some fish, invertebrates, birds, and mammals rely on the ocean for migration and habitat (AECOM). Sensitive marine species are discussed further in this section under sensitive habitats and species.

Various agencies have marine systems responsibilities. The United States Fish and Wildlife Service must monitor and protect otters, walruses, polar bears, manatees, and dugongs. The National Oceanic and Atmospheric Administration is responsible for seals, sea lions, whales, dolphins, and porpoises (USFWS). Sea otters are a recognized marine mammal and can be found among the site area.

Wetlands

Wetlands are any form of habitat or ecosystem that is wet for some period of time (USGS). The nonregulatory definition focuses on the hydrology, soils, and vegetation found among the wetlands. Therefore, periods of flooding and adapted plants would define a wetland. However, a wetland also has a regulatory definition that focuses on a broader set of habitats. Aquatic beds, wetted areas with no vegetation, and wet soils could be regulated as a wetland. The SGS, US Environmental Protection Agency (EPA), and US Army Corps of Engineers can regulate wetlands. The wetlands on the site are salt marshes, fresh and brackish-water marshes, swamps, mudflats, and the dune slack lakes (MIG).

The Santa Maria River lies in both Santa Barbara and San Luis Obispo Counties. The 35 acres of salt marshes are mainly comprised of pickleweed. The proposed project location isn’t directly implicating the quality of the Santa Maria River, but construction practices and potential damages could negatively impact the surrounding habitats and watersheds.
The Dune Lakes are composed of ten freshwater lakes in the backside of the Nipomo Dunes. They support marsh and riparian communities which are integral to the birds in the Pacific Flyway. The lakes are also important during hunting season and for nesting areas. Since many bird species nest in the same spot every year, if their normal nesting and breeding habitat are disrupted or damaged, they may not be able to successfully reproduce.

The Oso Flaco Lakes are two small dune-associated wetlands. They support a variety of biotic communities including freshwater marsh, riparian, and coastal sage scrub. Endangered species of both birds and plants reside in the area, and duck along with other waterfowl reside during migratory seasons.

The Black Lake Canyon is thin marshland extending inland from Dune Lakes, and it is one of the last freshwater marshes that migratory waterfowl utilize. There is debate about this area being considered a wildlife refuge, where any future development would be closely monitored to prevent sedimentation buildup in the marsh. The State Department of Parks and Recreation is currently working on developing a sediment basin or a similar method to ensure that irrigation water is entering the lakes. This is very necessary, as the lakes water supply should not contribute to further sedimentation.

Sensitive Species and Habitats

Within the project area, there are sensitive species and habitats that have the potential to be impacted. Sensitive communities include the Central Dune Scrub, Central Foredunes, Central Maritime Chaparral, Coastal and Valley Freshwater Marsh, Southern Vernal Pool, and Valley Needlegrass Grassland (MRS).

Plants

Sensitive plant species are defined by being endangered or threatened under the Federal Endangered Species Act, California Endangered Species Act, or California Native Plant Society. Some plants may also be considered sensitive if there is more information that is needed before impacting the species. Critical habitat refers to areas that if impacted, the wildlife species that rely on the habitat must also be considered (MIG). Therefore, impacts must also meet the requirements for species within the impacted critical habitat.

Table 4.2. A list of special status plants and the corresponding current status. Source: Information for Planning and Consultation (IPaC) under the US Fish and Wildlife Service (USFWS).

<table>
<thead>
<tr>
<th>Species: Plants</th>
<th>Status</th>
<th>Critical Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Jewelflower (<em>Caulanthus californicus</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td>Gambel’s Watercress (<em>Rorippa gambellii</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td>La Graciosa Thistle (<em>Cirsium loncholepis</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td>Marsh Sandwort (<em>Arenaria paludicola</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td>Nipomo Mesa Lupine (<em>Lupinus nipomensis</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td>Pismo Clarkia (<em>Clarkia speciosa ssp. immaculata</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td>Salt Marsh Bird’s-beak (<em>Cordylanthus maritimus ssp. maritimus</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td>Spreading Navarretia (<em>Navarretia fossalis</em>)</td>
<td>Threatened</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Animals**

Sensitive animal species are defined by being endangered or threatened under the Federal Endangered Species Act, California Endangered Species Act, or California Fish and Game Code. Similar to sensitive plant species, critical habitat refers to areas that if impacted, the wildlife species that rely on the habitat must also be considered (USFWS).

*Table 4.3: A list of special status animals and the corresponding current status. Source: Information for Planning and Consultation (IPaC) under the US Fish and Wildlife Service (USFWS).*

<table>
<thead>
<tr>
<th>Species: Animals</th>
<th>Status</th>
<th>Critical Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giant Kangaroo Rat (<em>Dipodomys ingens</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td>Southern Sea Otter (<em>Enhydra lutris nereis</em>)</td>
<td>Threatened-Marine</td>
<td></td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>California Clapper Rail (<em>Rallus longirostris obsoletus</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td>California Condor (<em>Gymnogyps californianus</em>)</td>
<td>Endangered</td>
<td>Yes</td>
</tr>
<tr>
<td>California Least Tern (<em>Sturna antillarum browni</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td>Least Bell’s Vireo (<em>Vireo bellii pusillus</em>)</td>
<td>Endangered</td>
<td>Yes</td>
</tr>
<tr>
<td>Marbled Murrelet (<em>Brachyramphus marmoratus</em>)</td>
<td>Threatened</td>
<td>Yes</td>
</tr>
<tr>
<td>Short-tailed Albatross (<em>Phoebastria albatrus</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southwestern Willow Flycatcher (<em>Empidonax traillii extimus</em>)</td>
<td>Endangered</td>
<td>Yes</td>
</tr>
<tr>
<td>Western Snowy Plover (<em>Charadrius alexandrinus nivosus</em>)</td>
<td>Threatened</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Reptiles</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blunt-nosed Leopard Lizard (<em>Gambelia silus</em>)</td>
<td>Endangered</td>
<td></td>
</tr>
<tr>
<td><strong>Amphibians</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>California Red-Legged Frog (<em>Rana draytonii</em>)</td>
<td>Threatened</td>
<td>Yes</td>
</tr>
<tr>
<td>California Tiger Salamander (<em>Ambystoma californiense</em>)</td>
<td>Threatened</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Fish</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tidewater Goby (<em>Eucyclogobius newberryi</em>)</td>
<td>Endangered</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Insect</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kern Primrose Sphinx Moth (<em>Euprosperinus euterpe</em>)</td>
<td>Threatened</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Crustacean</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vernal Pool Fairy Shrimp (<em>Branchinecta lynchii</em>)</td>
<td>Threatened</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Migratory birds have protection under the Migratory Bird Treaty Act and Birds of Conservation Control (BCC). The birds found within the Guadalupe-Nipomo Dune complex utilize wetlands and the ocean to migrate. The level of concerns is focused on whether birds of on the BCC list and if not, other concerns exist to protect the bird species. Non-BCC refers to birds that have concerns significant enough to be protected although they are not on the BCC list. BCC Rangewide (CON) means that the bird is threatened or endangered throughout all of its ranges in the continental United States. BCC-BCR means that the species is only on the BCC list in specific ranges set for bird conservation. Migratory birds are difficult to track so some birds
found on the project area may be missing from the list, as well as some birds on the list may not be found in the area (USFWS).

Table 4.4. A list of migratory bird species that are under protection of the Birds of Conservation Concern. Source: Information for Planning and Consultation (IPaC) under the US Fish and Wildlife Service (USFWS).

<table>
<thead>
<tr>
<th>Migratory Bird</th>
<th>Level of Concern</th>
<th>Breeding Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen’s Hummingbird (<em>Selasphorus sasin</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Feb 1 to Jul 15</td>
</tr>
<tr>
<td>Bald Eagle (<em>Haliaeetus leucocephalus</em>)</td>
<td>Non-BCC Vulnerable</td>
<td>Jan 1 to Aug 31</td>
</tr>
<tr>
<td>Black Oystercatcher (<em>Haematopus bachmani</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Apr 15 to Oct 31</td>
</tr>
<tr>
<td>Black Skimmer (<em>Rynchops niger</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>May 20 to Sep 15</td>
</tr>
<tr>
<td>Black Swift (<em>Cypseloides niger</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Jun 15 to Sep 10</td>
</tr>
<tr>
<td>Black Turnstone (<em>Arenaria melanoccephala</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Breeds elsewhere</td>
</tr>
<tr>
<td>Clark’s Grebe (<em>Aechmophorus clarkii</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Jan 1 to Dec 31</td>
</tr>
<tr>
<td>Common Yellowthroat (<em>Geothlypis trichas sinuosa</em>)</td>
<td>BCC-BCR</td>
<td>May 20 to Jul 31</td>
</tr>
<tr>
<td>Golden Eagle (<em>Aquila chrysaetos</em>)</td>
<td>Non-BCC Vulnerable</td>
<td>Jan 1 to Aug 31</td>
</tr>
<tr>
<td>Lawrence’s Goldfinch (<em>Spinus lawrencei</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Mar 20 to Sep 20</td>
</tr>
<tr>
<td>Long-billed Curlew (<em>Numenius americanus</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Breeds elsewhere</td>
</tr>
<tr>
<td>Marbled Godwit (<em>Limosa fedoa</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Breeds elsewhere</td>
</tr>
<tr>
<td>Mountain Plover (<em>Charadrius montanus</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Breeds elsewhere</td>
</tr>
<tr>
<td>Nuttall’s Woodpecker (<em>Picoides nuttallii</em>)</td>
<td>BCC-BCR</td>
<td>Apr 1 to Jul 20</td>
</tr>
<tr>
<td>Oak Titmouse (<em>Baeolophus inornatus</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Mar 15 to Jul 15</td>
</tr>
<tr>
<td>Rufous Hummingbird (<em>Selasphorus rufus</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Breeds elsewhere</td>
</tr>
<tr>
<td>Short-billed Dowitcher (<em>Limnodromus griseus</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Breeds elsewhere</td>
</tr>
<tr>
<td>Song Sparrow (<em>Melospiza melodia</em>)</td>
<td>BCC-BCR</td>
<td>Feb 20 to Sep 5</td>
</tr>
<tr>
<td>Spotted Towhee (<em>Pipilo maculatus clementae</em>)</td>
<td>BCC-BCR</td>
<td>Apr 15 to Jul 20</td>
</tr>
<tr>
<td>Tricolored Blackbird (<em>Agelaius tricolor</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Mar 15 to Aug 10</td>
</tr>
<tr>
<td>Whimbrel (<em>Numenius phaeopus</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Breeds elsewhere</td>
</tr>
<tr>
<td>Willet (<em>Tringa semipalmata</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Breeds elsewhere</td>
</tr>
</tbody>
</table>
Environmental Constraints Analysis

<table>
<thead>
<tr>
<th>Migratory Bird</th>
<th>Level of Concern</th>
<th>Breeding Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrentit (<em>Chamaea fasciata</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Mar 15 to Aug 10</td>
</tr>
<tr>
<td>Yellow-billed Magpie (<em>Pica nuttalli</em>)</td>
<td>BCC Rangewide (CON)</td>
<td>Apr 1 to Jul 31</td>
</tr>
</tbody>
</table>

There are no fish hatcheries or wildlife refuges in the proposed project location or proximity locations.

Environmental Sensitive Habitat Areas (ESHA)

The Coastal Act defines ESHA to mean any area that have plants, animals, or habitats that are recognized as “rare” and can be harmed due to human activities or developments. ESHAs have special services such as nesting for endangered birds, serving as critter corridors, or housing genetically special species. Much of the project area is ESHA land that must conserve and protect species. Certain activities are allowed among ESHAs such as restoration or nature studies, while other human activities are prohibited or regulated (California Coastal Commission).

Threshold of Significance

In Appendix G of the CEQA Guidelines for the Biological Resources issue area, the following checklist points that pertain to the project are determined with the following questions.

Would the project:

1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?
2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?
3. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?
4. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?
5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?
6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

4.3.2 Potential Environmental Concerns

**BIO 1** - The project could potentially have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?
There are 2 plant species whose habitat is specific to the area of the site, one of which is an endangered species, and the other is classified as threatened (as seen in Table 4.3). There are 10 animal species whose habitat is directly impacted by the project, 4 of which are considered endangered (as seen in Table 4.4). Habitat modifications to replace or restore harmed habitats would provide a stable environment after the project construction is finished, but a temporary habitat needs to be constructed. The Coastal Act protects the Environmental Sensitive Habitat Areas (ESHA) and will not allow certain construction activities in certain areas.

**BIO 2** - The project could potentially have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

Sensitive riparian habitats that could be implicated include the Central Maritime Chapparral, Valley Needlegrass Grassland, Coastal and Valley Freshwater Marsh, and the Southern Vernal Pool. According to the Clean Water Act, there isn’t any dumping of materials in the wetlands, and the construction and its effects can’t emit discharge into the wetlands and other waterways. Quality of the riparian habitats is necessary for certain species’ survival, as many endangered species, and/or species who qualify the proposed site as critical habitat, nest and breed in or around the wetlands and rivers.

**BIO 3** - The project could potentially have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

The U.S. Army Corps of Engineers reviews the permits for construction in wetland areas through the Clean Water Act. They will not approve a general permit, which requires the least amount of individual review, since the proposed project is more invasive than typical, minor, construction activities. The construction of the pipeline to and from the desalination plant will require drilling and could impact the wetlands through the vibrations. The federally protected wetlands located in the project site are the Coastal and Valley Freshwater Marsh and the Southern Vernal Pool. These areas will be under strict regulations in regards to hydrological vibrations through the pipeline installation, removal of land to make way for the pipeline, and possible leakage from the pipeline once it is functional.
Figure 4.3: Map from the National Wetlands Inventory displaying wetland and marine habitat areas near the project site. Obtained from the US Fish and Wildlife Service.

BIO 4- The project could potentially interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

As seen in Table 4.5, there are 24 identified species of migratory birds that fall under the Birds of Conservation Concern that may be found within the site area. Many of these species utilize the ocean or wetlands as migratory stops. Therefore, to be in accordance with the United State Fish and Wildlife Service and the Migratory Bird Treaty Act, construction and operation practices must not “take” a bird (USFWS). There may not be any takes during the restoration efforts either. Most of the wetland and dune habitats would fall under the restoration area although construction could occur in ESHA areas due to pipelines that connect the ocean to the desalination treatment facility. Some of these ESHA lands are where the migratory species occupy (IPaC). Specifically, the winter snowy plover has nesting sites along the dunes. Pipeline installation would be short term, but have the potential to alter migratory movement. Restoration such as revegetation, invasive species removal, and erosion buffers could also inhibit migration.
**BIO 5** - The project could potentially conflict with any local policies or ordinances protecting biological resources.

Currently, there is a Coastal Zone Land Use Ordinance that has been adopted by San Luis Obispo Count, certified by the California Coastal Commission, and revised in April 2019. This land ordinance has ESHA permits that require an application to be submitted whenever infrastructure is going to be built within or adjacent to land designated as ESHA. A qualified biologist must create a report that shows the environmental impacts. Generally, if an application is to be passed, there must be no significant impacts. Most projects occurring within ESHAs are also prohibited. However, due to the restoration aspect of the project, a permit could be approved. The ordinance says that areas must be delineated and made a restoration plan before any recovery may occur (Coastal Zone Land Use Ordinance).

**BIO 6** - The project could potentially conflict with the provisions of a Habitat Conservation Plan (HCP), Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

As of 2020, there is Habitat Conservation Plan draft for the Oceano Dunes District. The draft details biological settings including many sensitive species. The report focuses on managing land properly in order to improve habitats for species such as the Western Snowy Plover, California Least Tern, California Red-Legged Frog, and Tidewater Goby. The plan focuses on adaptive management that prevents interruption of their range. Restoration efforts or pipeline installation may conflict with these preventative measures (MIG). Operation and restoration plans would likely not conflict with the HCP, but installation avoidance should occur to prevent significant impacts.

### 4.3.3 Recommendations

**BIO 1** - The project could potentially have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?

A temporary habitat needs to be made for the endangered and critical habitat species. The habitat should be fully functional with the accurate amounts and timing of water and sunlight and typical vegetation. The habitat modifications should either improve the overall wellbeing of the area, or simply restore it to its former stability. Create habitat buffer zones between the construction and modified areas and the protected habitats in case of animal crosses. A qualified biologist will inspect the newly restored and modified habitats for insurance on species successes and survivals in the new habitat. Overall, encourage construction workers to dispose of trash efficiently.

**BIO 2** - The project could potentially have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

There needs to be data taken from the riparian soil, water, and air before, during, and after the project is implemented to ensure that the levels go back to where they were before the project began. Dumping of materials or waste needs to be surveyed constantly. Construction of the
pipeline can’t interfere with the breeding and mating behaviors of the endangered species or species who define this habitat as critical.

**BIO 3-** The project could potentially have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

The construction of the pipeline can’t interfere with the quality of water in the protected watersheds. There will be an avoidance strategy in place to correct pipe leaks if they occur in the future to minimize the damage to the watersheds. Careful monitoring of the stability of the pipeline would occur to prevent leaks and would include bi-monthly check-ins both above and below the water's surface, as well as water quality checks around the pipeline. Avoidance of placing the pipeline and other structures on sink-swell soils should occur as they could compromise the integrity of the foundation.

**BIO 4-** The project could potentially interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Migration patterns of the identified species range from March 15-October 31. Therefore, a significant avoidance factor is timing. Pipeline installation and removal of invasive species should occur during the low times of migration. Even during restoration methods, habitats can be initially impacted as vegetation changes or surveys are taken. Therefore, most of the construction or restoration work that alters migratory bird habitat should occur in late fall and winter.

A second avoidance measure would be constructing pipelines away from native wildlife nurseries such as the Western Snowy Plover critical habitats. Using maps, biological surveys, and terrain, the placement of the pipelines should be considered greatly to avoid impacts to migratory birds and nurseries.

**BIO 5-** The project could potentially conflict with any local policies or ordinances protecting biological resources.

Communication with the California Coastal Commission is key. An application would be made to restore the ESHAs in the project area. A survey and report of where the pipelines would go within the ESHA habitat would need to be mapped and justified. Installing the pipelines in less dense ESHA would improve the impact. Specific restoration plans for special status species may be beneficial to create similar to the analyses in the Ocean Dunes Habitat Conservation plan draft. Without knowing the location of the pipelines, specific species are difficult to identify. Such plans could include the Western Snowy Plover, California Red-Legged Frog, or La Graciosa Thistle.

**BIO 6-** The project could potentially conflict with the provisions of a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

The draft is focused on protecting special status species, so reports and restoration plans specific for these species must be delivered. Maps and biological surveys such as
reconnaissance surveys for the dunes would occur. As stated, the HCP is a draft so the report holds no current significance, but if the draft is adopted, then the plan must be considered to apply with CEQA Appendix G. If the plan is adopted, construction and installing the pipelines should not conflict with the species explored in the HCP. Further reference the recommendations for BIO-2, BIO-3, and BIO-5 for considerations for placement of the pipelines to further comply with the HCP.
Figure 4.4: Map of the combining designations for biological resources. Data layers were obtained from the SLO county GIS open data site.
4.4 Air Quality

4.4.1 Issue Area Description

Existing Conditions

The County of San Luis Obispo published a Clean Air Plan in 2001 that details the methods that SLO County is practicing in an effort to meet compliance standards in accordance with the California Clean Air Act. These standards have been adopted at the state and national level in order to protect public health, vegetation, materials, and visibility. Included in the plan are various control measures that were adopted to control emissions. These control techniques include vapor recovery, solvent content reduction, improved transfer efficiency, improved fuel combustion, fuel switching or electrification, chemical or catalytic reduction, reduced vehicle use, new source review, and indirect source review.

Within the County there are multiple regions and the air quality in each of these regions varies considerably. The project site is in the area considered part of the Coastal Plateau region which has more people and development than other regions. This results in a typically worse air quality in this region which can be seen in the following graphs taken from the EPA’s website.

*Figure 4.5 shows the average air quality index (AQI) from 7:00 pm April 25, 2021 to 6:00 pm April 26, 2021 for the Nipomo Regional Park Monitoring Station. The AQI is calculated each hour over the 24 hour period. Image taken from the EPA's airnow.gov website.*
The first graph reflects the AQI for the Nipomo Regional Park Monitoring Station which is approximately 5 miles from the project site. The second graph reflects the AQI for the San Luis Obispo Roberto Monitoring Station which is located in the city of San Luis Obispo. Both monitoring stations are operated by the SLO County Air Pollution Control District and the average AQI's were collected over the same date. As can be seen from comparing the two graphs, the Nipomo monitoring station has noticeably worse average air quality than the city of San Luis Obispo.

According to the SLO County Air Pollution Control District, the South County air basin is currently non-attainment for two criteria pollutants (APCD). The first of these is ozone, which the state of California has set the attainment level of 0.070 ppm. Ozone is a naturally occurring component of air, however with nitrogen oxides and hydrocarbons released from vehicle exhaust and industrial activities react they lead to the production of much higher levels of ozone that what occur naturally. The effects of increased ozone levels include health damage to lungs, reduced crop yields, and the increased deterioration of building materials such as plastics and rubber. The second criteria pollutant the SLO County is in non attainment for currently is PM10. PM10 is particular matter with a diameter of 10 micrometers. These are produced from vehicle exhaust, road dust, mineral quarries, grading, demolition, agricultural tilling, and burning. The effects of PM10 include reduced visibility and respiratory illness. According to the research paper, “Stack emissions from desalination plants: a parametric sensitivity analysis for exposure

Figure 4.6 shows the average air quality index (AQI) from 7:00 pm April 25, 2021 to 6:00 pm April 26, 2021 for the San Luis Obispo Roberto Monitoring Station. The AQI is calculated each hour over the 24 hour period. Image taken from the EPA’s airnow.gov website.
assessment” neither ozone or PM10 is considered to be an emission associated with desalination plants. The main factor of how much air pollution is linked to the facility would be where the plant derives its power from. Lastly, the construction phase of the facility could potentially lead to increased PM10 levels, especially given the loose, sandy nature of the soils in the area.

Sensitive receptors to air pollutants are considered as children and those individuals who have compromised cardiac and/or respiratory systems. Sensitive receptor locations include schools, residential dwellings, parks, day care centers, nursing homes, and hospitals. As seen in the diagram below, taken from the Air Pollution Control District (APCD) website, the Nipomo Mesa area does contain elevated levels of particulate matter pollution.

![Diagram of SLO APCD AQI Regions](image)

**Figure 4.7:** Display of the Nipomo Mesa area and the associated levels of particulate matter pollution. The darker colors are associated with higher levels of pollutants. Sensitive receptor locations are displayed as icons. Source: Air Pollution Control District (APCD) website.

As can be seen in the above image, the dunes area has elevated levels of particulate matter pollution that extends out onto sensitive receptor locations. Studies performed by the APCD suggest that these pollutants are windblown dust from the open sands area of the Oceano Dunes State Vehicular Recreation Area (SVRA). As a result, in 2011 the APCD approved the Coastal Dunes Dust Control Rule 1001 to require mitigation efforts in areas where off road vehicle use occurs to lessen the impacts of windblown dust.

Odors or other emissions that would adversely affect a substantial number of people would be considered. The proximity to the coast, the salty breezes, Oco Flaco Lake, and environmentally...
sensitive habitat areas create the majority of the scents that would be detected in and around the project site.

Currently, the Santa Maria Refinery is operating on the project site. While the refinery is subject to the air quality standards found in the California Clean Air Act, there are certain emissions typically associated with a refinery, including carbon dioxide, oxides of sulfur (SOx), oxides of nitrogen (NOx), particulate matter (PM10), carbon monoxide (CO), and reactive organic gases (ROG) including Volatile Organic Compounds (VOC). Some of these including carbon dioxide, nitrous oxide, and reactive organic gases contribute to greenhouse gas emissions.

Thresholds of Significance

In Appendix G of the CEQA Guidelines for the Air Quality and GHG emissions issue area, the following checklist points that pertain to the project are determined with the following questions.

Would the project:

- Conflict with or obstruct implementation of the applicable air quality plan?
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation?
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?
- Expose sensitive receptors to substantial pollutant concentrations?
- Create objectionable odors affecting a substantial number of people?

4.4.2 Potential Environmental Concerns

**AIR 1** - The project will not conflict with or obstruct implementation of the applicable air quality plan.

Based on the current project description and looking at comparable EIR's for desalination plants the project would not conflict with any air quality plan. This includes the CAP, general plan, or any federal air quality legislation. Impacts to an applicable air quality plan would most likely be less than significant.

**AIR 2** - The project could potentially violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Vehicle emissions may generate greenhouse gas emissions, either directly or indirectly related to the construction of the facility, that may have a significant impact on the environment. During the construction phase of the project there will be increased vehicle traffic to and from the project site. This is caused in large part by the transportation of building materials, removal of waste, and worker commute. Another factor to consider will be the use and operation of heavy machinery and the tailpipe emissions associated with their operation. SLO County is currently in attainment for emissions associated with vehicles. These effects would be short term as the construction phase is not the culmination of the project and would not be expected to impact sensitive receptors in the area. Some emissions associated with tailpipes would potentially result in significant impacts. SLO County is currently non-attainment for PM 10 and Ozone.
The only operation aspect of the desalination facility with the potential to affect air quality is where the energy used to power the plant is sourced from. This would be an indirect effect of operating the plant. As stated earlier in the project description section, the reverse osmosis process as well as the necessary pumping stations require substantial amounts of energy. While it is to be assumed for now that the plant will receive its energy from the local electricity grid, further analysis could be performed in order to address the impacts of this demand on the grid, as well as the overall impact of increased demand on the air emissions associated with power generation locally. Any additional Ozone emissions would be considered significant given SLO County’s current non-attainment status. There is potential for non-significant impacts to air quality due to increased GHG, SOx, NOx, and visibility reducing particles as an indirect impact of operating the desalinization facility depending on where the necessary energy is produced.

There is potential for increased PM 10 and Ozone emissions due to tailpipe emissions during the construction phase of the project which would be significant. There is potential for increased NOx, SOx emissions which would be less than significant. There is potential for significant impacts to air quality if Ozone levels were to increase as an indirect impact of operating the desalinization facility depending on where the necessary energy is produced.

**AIR 3** - The project could result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Exposed soils may result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard and expose sensitive receptors to substantial pollutant concentrations. According to the San Luis Obispo Air Pollution Control District (SLOAPCD), SLO County is currently non-attainment for PM 10 air pollution. The project site is also in close proximity to the Oceano Dunes which have historically high wind-blown dust erosion that contributes to PM 10 levels. Further, the soil beneath the project site is very sandy and prone to windblown erosion as well. There are also sensitive receptors within the impacted area of increased PM 10 emissions caused by the dunes. During the construction phase there is potential for increased exposed soils through demolition of existing structures, regrading of the site, tunneling, improving infrastructure, and installing new buildings. All of these could result in increased PM 10 and PM 2.5 emissions. These effects would be short term as the construction phase is not the culmination of the project. However, because SLO County is currently non-attainment for PM 10 levels, any additional PM 10 emissions from the project would be significant. There is potential for increased PM 10 emissions during the construction phase of the project.

**AIR 4** - The project could expose sensitive receptors to substantial pollutant concentrations.

As shown above in the project description there are multiple sensitive receptors in vicinity of the Oceano dunes that are currently slightly affected by increased PM 10 pollution. The majority of this pollution is dust coming off the dunes in the OHVSRA. However, the project is a desalination plant that does not have the potential to expose these sensitive receptors to worse concentrations of pollutants. The impacts to sensitive receptors due to the project would be less than significant.
The project would not create objectionable odors affecting a substantial number of people.

The project does not contain any odor emitting sources and desalination is not considered to be an odor emitting process. The impacts to odors would be less than significant.

### 4.4.3 Recommendations

- **AIR 1-** The project will not conflict with or obstruct implementation of the applicable air quality plan.

There are no recommendations for this section because the effects are likely considered to be less than significant. Ensuring that PM 10 and ozone pollution does not increase will be important because they are pollutants that SLO County is currently non-attainment for, but those recommendations are covered in later impacts.

- **AIR 2-** The project could potentially violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Encouraging efficiency in transporting materials, heavy machinery use, and worker carpooling are recommended ways to reduce emissions due to tailpipe emissions during the construction phase of the project. Frequent reference to the Nipomo-Mesa2 air monitoring station should be conducted in order to make sure that there are not notable increases to pollutants due to vehicle emissions associated with the project.

While the desalinization facility in operation would not directly generate greenhouse gas emissions, there are indirect greenhouse gas emissions associated with it. According to the environmental impact report (EIR) prepared for the desalinization plant in Carlsbad, CA there are greenhouse gas emissions associated with the construction phase of the project. These emissions come from a variety of sources, most of them being exhausts from fossil fuel powered equipment used in the construction process of the facility, pumping stations, pipelines, and vehicles used for workers commuting. However, the EIR concluded the only emissions that would pass threshold levels was NOx and this was only temporary and not impactful. The levels of CO, ROC, SOx, and PM10 in their findings did not exceed thresholds and so impacts to air quality onsite during construction were considered to be not significant. A key factor in determining the effect of a desalinization facility on greenhouse gas emissions is the source for the facility’s power. Desalinization requires considerable amounts of power for the reverse osmosis process, and the energy comes from determines the net effect on greenhouse gas emissions. The Carlsbad Desalination EIR found that desalinization requires on average 29.76 megawatt hours (MWh) of electricity, and 35.5 MWh during peak production. With the closure of Diablo Canyon Nuclear Power Plant coming in 2025, SLO county will already be forced to examine where it is going to turn for power.

There is not much mitigation that can be conducted for the indirect effects of increased energy production because the electric grid is already established and the sources of energy are not in question. Monitoring of air quality stations near power generation once the plant becomes operational is recommended to ensure there are not noticeable increases in emissions, especially ozone or PM 10 due to the plants operation. To reduce the project’s
impact on the electrical grid and to improve the overall sustainability of the project, options like onsite solar should be considered and their feasibility assessed.

| AIR 3- | The project could result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). |

To reduce wind erosion of exposed soils and increase airborne PM 10 levels, soils should be covered whenever possible. Examples of acceptable coverage includes vegetation, mulch, or an erosion control fabric. To further reduce wind erosion windbreaks should be implemented to break up the wind length. Future studies should be done on prevailing wind direction seasonally and the windbreaks should be adjusted accordingly. In especially windy conditions wetting the soil is a recommended practice to keep dust down, especially near road traffic. During the construction phase of the project the site entrance/exit will need to be stabilized due to the high volume of traffic in this area. This will include ensuring there is no bare soil, keeping sediment off the roadways, and making sure that dust and other sediment is not leaving the site on tires and equipment.

| AIR 4- | The project could expose sensitive receptors to substantial pollutant concentrations. |

There are no recommendations for this section because the effects are likely considered to be less than significant.

| AIR 5- | The project would not create objectionable odors affecting a substantial number of people. |

There are no recommendations for this section because the effects are likely considered to be less than significant.
Figure 4.8: Map of the air quality monitoring stations near the project site and within SLO county.
4.5 Aesthetics

4.5.1 Issue Area Description

Existing Conditions

The proposed project is located in unincorporated San Luis Obispo County just west of the community of Nipomo and east of the Oceano Dunes in a predominantly rural area. The project site occupies sandy dune soils in an area that is mainly comprised of degraded and grazed central dune scrub habitat. The Phillips 66 Santa Maria Refinery currently occupies the 1,780-acre site with about 200 acres actually in use by the company operations (AECOM). The oil refinery is comprised of a circuit of buildings and tall steel piping. The existing light and glare conditions consist of substantial light pollution at night from security and operational lighting while there is less substantial glare from the structures during the day. The refinery requires lighting at night mainly for security purposes, and this is significant because of the relative openness and lack of additional light in the surrounding area. There is some glare during the day from the metallic piping and structures that stands out against the dull sandy landscape. The Phillips 66 Santa Maria Refinery sits about 0.5 mile southwest of the nearest light receptor which is an area comprised of a mix of industrial, commercial, and residential uses. The remainder of the land is held as open space, wildlife preservation areas, and cattle grazing.

The existing visual character of the rural and agriculture lands consists primarily of more dune scrub habitat and low growth agriculture fields. There are minimal trees and vegetation with significant height, so the project site sits well above the surrounding landscape. The existing visual character of the adjacent residential and commercial areas consists of small to medium sized homes in neighborhoods and low-rise buildings in a business district. The Union Pacific Railroad runs adjacent to the project site to the west through the open space area. An ORV Park and beach are located to the west of the rail line at the Pismo Dunes State Vehicular Recreation Area. State Route 1 is located to the north of the project site and is not designated as a State Scenic Highway through this area. The closest State Scenic Highway is about 14 miles north of the project site (Caltrans). The refinery can be viewed very briefly on two small portions of State Route 1, to the east and north. The ocean is not visible from this location and much of the open land is nearly flat and featureless, consisting of sandy soils and low-growing vegetation. This area includes some moderate slopes with high-quality central dune scrub vegetation that hosts a variety of sensitive plant and bird species (AECOM). Other surrounding land uses include intensive agriculture to the south and urbanized residential and light industrial uses to the east and northeast in the communities of Nipomo and Callendar-Garrett.

The baseline condition of the project area consists of industrial plant activity with the Phillips 66 Santa Maria Refinery. Therefore, retrofitting the site for a desalination plant wouldn’t be a large change from current conditions. The scenic highway does not display the refinery often, and there is much open space among the dunes, but the industrial site can still be seen. Generally, most photography of the Nipomo Mesa dunes features sand dunes, ocean, and vegetation. People may be upset to know that another industrial plant would be built with a refinery. As seen in the pictures below, there is a stark difference between open dunes and the Phillips 66 refinery.
Figure 4.9: This photo depicts the open view of the Oceano Dunes and is featured on the Highway 1. Source: Santa Maria Sun News

Figure 4.10: This photo displays the Phillips 66 Santa Maria oil refinery from the Oceano dunes. The stark contrast between the industrial activity and the natural environment can be seen here. Source: Santa Maria Sun News
Threshold of Significance

In Appendix G of the CEQA Guidelines for the Aesthetics issue area, the following checklist points that pertain to the project are determined with the following questions.

Would the project:

   a) Have a substantial adverse effect on a scenic vista?

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

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

   d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

4.5.2 Potential Environmental Concerns

AES 1 - The project does not have a substantial adverse effect on a scenic vista.

Within the vicinity of the study area there are no scenic vistas that would be adversely affected by the construction or operation of the desalination plant. The site is visible from State Route 1 very briefly at two locations to the north and east and also briefly visible from the Union Pacific Railroad. The freshwater storage building has the most potential to be seen based on its height compared to pretreatment, post-treatment, and reverse osmosis buildings.

AES 2 - The project would not damage scenic resources, including but limited to, trees, rock outpourings, and historic buildings within a State Highway.

According to the California Department of Transportation Scenic Highways Program, the closest designated State Scenic Highway to the project site is 14 miles to the north on State Route 1. This section would pose an insignificant impact based on this fact. The construction operations would be confined to the project site and would not result in the removal of the existing landscaping along the property boundaries. The project site occupies sandy dune soils in an area that is mainly comprised of degraded and grazed central dune scrub habitat so there would be of little concern that any trees or rock outcroppings would be damaged through the implementation of the desalination plant.

AES 3 - The project could potentially degrade the existing visual character or quality of the site and its surrounding.

The baseline condition of the project area has existing industrial activity with the Phillips 66 Santa Maria Refinery. Therefore, retrofitting the site for a desalination plant would not be a large change from current conditions. The intake pump should also be negligible because of the plan to use an offshore system. A no project alternative, for example reverting the site to natural habitat, should be considered. It will be important to consider the local communities’ thoughts on the project in that some people might be disappointed in the continuation of industrial activities in this area. The proposed desalination plant structures would be similar in scale and mass.
compared to the Phillips 66 Santa Maria refinery that currently occupies the land. The proposed plant is recommended to be constructed on the 200 acres (of the 1,780-acre property) currently occupied by the refinery as to avoid occupying any undisturbed land or habitats. Due to the nature of the dune scrub landscape, there is a stark difference between the project site and the surrounding landscape.

AES 4 - The project could potentially create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

The project site sits about 0.5 mile southwest of the nearest light receptor which is an area comprised of a mix of industrial, commercial, and residential uses. The remainder of the land is held as open space, wildlife preservation areas, and cattle grazing. Due to its location, the project site sits relatively exposed and would stand out at night. Similar to the existing buildings on the Phillips 66 Refinery Site, the proposed new structures would have some low voltage outdoor security lighting which could be mitigated through a few corrective measures. The outdoor lighting would be confined to the immediate area and would not spill over into adjacent areas. Construction operations for the proposed project should occur during the day. Therefore, no nighttime construction lighting would be required. Some glare impacts could occur from construction equipment during the day. However, the impacts would be confined to the site area and would not have any significant offsite light and glare impacts.

4.5.3 Recommendations

AES 1 - The project does not have a substantial adverse effect on a scenic vista.

There are no scenic vistas in the vicinity of the project site.

AES 2 - The project would not damage scenic resources, including but limited to, trees, rock outpourings, and historic buildings within a State Highway.

The nearest State Scenic Highway is 14 miles to the north of the project site and there would be no removal or degradation to any trees, rock outcroppings, or large significant biological resources.

AES 3 - The project could potentially degrade the existing visual character or quality of the site and its surrounding.

The project site sits exposed in a relatively barren landscape so it may be prudent to use materials for the desalination plant that blend into the dune scrub habitat. Furthermore, although there will be no likely CEQA impact, due to the site remaining zoned for industrial use, there will likely be a perceived impact from a socio-political standpoint because of the lost opportunity to transition from an industrial land use to something less intensive like recreation, open space, restoration, etc. We recommend that a community meeting or consensus be held to discuss this issue further and gage the local community’s feelings and opinions about the proposed project.

AES 4 - The project could potentially create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

All onsite lighting should be directed away from adjacent residential, commercial, and industrial uses to the northeast and away from both State Route 1 and the Union Pacific Railroad. Such
corrective measures may include providing additional shielding on light fixtures, relocating lighting fixtures and reducing the intensity of lighting. Furthermore, construction should be done during the day to avoid any additional affects to nighttime views.
Figure 4.11: Map of the viewpoints near the project site. Data obtained from the SLO county GIS open data site.
5 Environmental Processes and Permits

Local Permitting

*Land Use Ordinance Title 23*

Through Title 23, a coastal development permit would be triggered by this project since there would be development within the Coastal Zone of San Luis Obispo county. The goal of the ordinance is to regulate land use in order to allow development while not impeding public access to the coast, nor harming natural resources. No construction or alteration may occur in any coastal zone until all requirements are met as outlined by Title 23. Permitting must be in compliance with the San Luis Obispo County Local Coastal Program and California Coastal Act.

The applicant is encouraged to request a pre application survey with the Department of Planning and Building to discuss the amount and level of restriction the policies and standards are for the specific project. The Determination of Completeness will tell the applicant if their application has been accepted for processing or if it is still incomplete. If the application is incomplete, a list will be provided, detailing what requirements are missing, (usually plot plans and minor use permits). If the Planning Director finds unusual components of the project of project site, they can either waive or reduce certain requirements, as long as the loss of that documentation doesn’t inhibit the Planning Director in determining the project’s compliance with the Land Ordinance’s codes. The Planning Director will also report to other involved agencies of the project, including the Air Pollution Control District, California Coastal Commission, Engineering Department, Fire Department, Health Department, Incorporated Cities, Regional Water Quality Control Board, Special Districts, and Public Utilities. In order to speed up the process of getting permits approved, if the permits required in many projects overlap (which happens regularly), they can consolidate the permits by obtaining the highest permit level (for example, land use).

A Plot Plan is a ministerial land use permit. Its approval shows that the project’s development is in accordance with the Coastal Zone Land Use Ordinance (CZLUO). The Plot Plan enables the approval of the land use that does not require construction permits. The Minor Use Permit should satisfy the notice and public hearing requirements established by the California Coastal Act for Plot Plans. The Development Plan is to enable public review of certain land uses proposals. For more information on zoning, plot plans, minor use permits, and development plan, reference Appendix A- Local Permitting Details. The public review process can be found in San Luis Obispo’s Land Use Ordinance. Ultimate authority does not go to the county, although the county can issue permits, but rather the California Coastal Commission.

*South County Coastal Area Plan*

The South County Coastal Area plan contains lots of information on the various permits that Union Oil has for the site currently, and restrictions that exist on the project site. It is not clear at this time which restrictions will remain once the refinery is no longer operational and Union Oil is not the owner of the site. Such permit requirements can be found in Appendix A.

The South County Plan area covers 154 square miles including the Nipomo Mesa project site. The South County Coastal Area Plan contains standards that apply to Industrial properties along south Sheridan Road. According to the South County Coastal Area Plan, Industrial uses...
are to only have access from South Sheridan Road, not from the adjacent residential uses to
the east. The project site also falls within the heavy industrial use zone, as seen in the below
image. The South County Coastal Area Plan contains a list of allowable uses in this area. When
there is a Coastal Zone Land Use Ordinance (CZLUO) standard the permits are then
determined by the CZLUO. Desalination is not listed as an allowable use in this table, but there
are uses that desalination is somewhat similar to and so the permit requirements may be similar
in nature.

Table 5.1 Lists the various permits and permit numbers required for specific industrial uses
south of Sheridan Road that may be required for the project under the South County Coastal
Area Plan.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Coastal Zone Land Use Ordinance Special Use Standards</th>
<th>Permit Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipelines and Power Transmission</td>
<td>23.08.284</td>
<td>23.08.284</td>
</tr>
<tr>
<td>Water Wells and Impoundment</td>
<td>23.08.178</td>
<td>Minor Use Permit</td>
</tr>
</tbody>
</table>

Figure 5.1: Depicts the area south of Sheridan Road that is subject to the various restrictions
listed above. Taken from the South County Coastal Area Plan website.
Allowable Land Uses in the Coastal Zone

The Coastal Table O and charts list the uses of land that may be established in the specified land use categories. It is important to additionally check the planning area standards and any policies from the Coastal Plan Policies Document that could apply to the property. The allowable uses chart supports finding the standards within the Coastal Zone Land Use Ordinance to apply in the planning and development of such uses and which permits will be needed. The definitions to the Use Status are stated below:

- **“A”** – Allowed use, unless otherwise limited by a specific planning area standard. Coastal Zone Land Use Ordinance Chapter 23.03 (“Required Level of Processing”) determines the permit necessary to establish an "A" use, and Chapters 23.04 through 23.06 determine the site design, site development, and operational standards that affect the use. See also the “Planning Area Standards” sections of the Land Use Element Area Plans and the LCP Policy Document to find any standards that may apply to a project in a particular community or area.

- **“S”** – Special use, allowable subject to special standards and/or processing requirements, unless otherwise limited by a specific planning area standard. The following list (Table 5.2) shows where in the Coastal Zone Land Use Ordinance to find the special standards that apply to particular uses.

- **“P”** – principally permitted use, a use to be encouraged and that has priority over non-principally permitted uses, but not over agriculture or coastal dependent uses.

**Table 5.2: shows the relevant special uses for the Nipomo Mesa Desalination Plant Project**

<table>
<thead>
<tr>
<th>“S” NUMBER</th>
<th>APPLICABLE COASTAL ZONE LAND USE ORDINANCE SECTION AND/OR LAND USE ELEMENT REQUIREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23.08.120 b MISCELLANEOUS USES</td>
</tr>
<tr>
<td>2</td>
<td>23.08.120 a MISCELLANEOUS USES</td>
</tr>
<tr>
<td>4</td>
<td>23.08.060 CULTURAL, EDUCATIONAL &amp; RECREATIONAL USES</td>
</tr>
<tr>
<td>5</td>
<td>23.08.080 INDUSTRIAL USES – allowable, subject to the special standards found in Section 23.08.080</td>
</tr>
<tr>
<td>9</td>
<td>23.08.170 RESOURCE EXTRACTION</td>
</tr>
<tr>
<td>14</td>
<td>Uses are allowable in the Open Space land use category on privately-owned land subject to the Coastal Zone Land Use Ordinance Section 23.08.120a in addition to the special standards in Chapter 23.08, only when authorized by a recorded open space agreement executed between the property owner and the county. On public lands, uses designated are allowable subject to Coastal Zone Land Use Ordinance Section 23.08.120b, in addition to the special standards found in Chapter 23.08.</td>
</tr>
<tr>
<td>20</td>
<td>23.08.300 ELECTRIC GENERATING PLANTS</td>
</tr>
</tbody>
</table>
Table 5.3: Use groups associated with the land use categories for the project site from the Coastal Table “O” in the Local Coastal Plan.

<table>
<thead>
<tr>
<th>Use Group/Page # of Use</th>
<th>LAND USE CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial</td>
<td>Open Space</td>
</tr>
<tr>
<td>Electric Generating Plants/6-44</td>
<td>S-20-P</td>
</tr>
<tr>
<td>Water Wells &amp; Impoundments/6-61</td>
<td>S-9-P</td>
</tr>
<tr>
<td>Waste Disposal Sites/6-60</td>
<td>S-1</td>
</tr>
<tr>
<td>Public Utility Facilities</td>
<td>S-13</td>
</tr>
<tr>
<td>Pipelines and Transmission Lines</td>
<td>S-14</td>
</tr>
</tbody>
</table>

The current land use categories within the project site parcels are established as Industrial and Open Space. The use groups listed in Table 5.3 are applicable to the Nipomo Mesa Desalination Plant Project and are mostly categorized as allowable special use that is subject to special standards and processing requirements. The use groups are defined and summarized in relevance to the project as follows:

- **Electric Generating Plants [D4] [Amended 1995, Ord. 2740]** – Facilities engaged in the generation and distribution of electrical energy for sale. The electricity may be generated from oil, gas, coal or nuclear fuels or from “alternative sources including but not limited to water, wind, the sun, bio-gas, municipal or agricultural wastes.
- **Water Wells and Impoundments [F5]** – Water extraction uses or structures for small scale domestic or agricultural use including wells, ponds, water tanks and distribution facilities.
- **Waste Disposal Sites [H16]** – County-approved or operated refuse dumps, sanitary landfills and other solid waste disposal facilities of a terminal nature, where garbage, trash or other unwanted materials are abandoned, buried or otherwise discarded with no intention of re-use. This definition does not include disposal sites for hazardous waste materials.
- **Public Utility Facilities [J5]** – Fixed base structures and facilities serving as junction points for transferring utility services from one transmission voltage to another or to local distribution and service voltages. These uses include any of the following facilities: electrical substations and switching stations; telephone switching facilities; natural gas regulating and distribution facilities; public water system wells, treatment plants and storage; and community wastewater treatment plants, settling ponds and disposal fields.
- **Pipelines and Transmission Lines [J4]** – Transportation facilities primarily engaged in the pipeline transportation of crude petroleum; refined products of petroleum such as gasoline and fuel oils; natural gas; mixed, manufactured or liquefied petroleum gas; or the pipeline transmission of other commodities. Also includes pipeline surface and terminal facilities, including pump stations, bulk stations, surge and storage tanks.

The project will require the additional generation of power for the operation of the desalination plant but will most likely stay onsite for facility uses. The plant will extract ocean water sources instead of the listed freshwater sites under “Water Wells and Impoundments”. The brine discharge from the site will be considered a waste product of desalinated water, resulting in the use category of waste disposal sites. The submerged disposal will be the assumed method for the project as it is discarded with no intention of re-using. The intake and discharge pipelines...
will be subject to special standards if not otherwise specified, as the project site includes pump stations, onsite storage tanks, and the transmission of commodities and resources.

**Federal and State Permitting**

There are several federal and state permits anticipated for the proposed project. Table 5.4 summarizes the potential regulatory permits and approvals that are affiliated with the proposed project. The regulations listed below represent an initial assessment of the permitting requirements and are organized by agency.

*Table 5.4: Potential permits and approvals associated with the Nipomo Mesa Desalination Project with the top entities being federal agencies and the lower ones being state agencies.*  
*Source: Professor Sarah Spann*

<table>
<thead>
<tr>
<th>Regulatory Agency</th>
<th>Underlying Statute or Regulation</th>
<th>Permit/Approval</th>
<th>Regulated Activity</th>
<th>Other Related Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Federal Agencies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>U.S. Army Corps of Engineers</strong></td>
<td><strong>Rivers and Harbors Act 33 U.S.C. §§ 400 – 467 (1899)</strong></td>
<td><strong>Section 10 Permit</strong></td>
<td><strong>Construction, excavation, or deposition of materials in, over, or under such waters, or any work which would affect the course of those waters.</strong></td>
<td><strong>NEPA compliance</strong></td>
</tr>
</tbody>
</table>
| **US Army Corps of Engineers**        | **Clean Water Act 33 U.S.C. §1251 et seq. (1972)**                                              | **Section 404 Individual Permit or Nationwide Permit** | **Any point source discharge of dredged or fill material into Waters of the US. Including bank stabilization and grading in the Waters of the US. Both temporary and permanent impacts.** | **• NEPA compliance**  
**• Compliance with the National Historic Preservation Act (NHPA) Consultation under Section 106 through the SHPO.**  
**• California Coastal Commission Letter of Concurrence with the** |
<table>
<thead>
<tr>
<th>Regulatory Agency</th>
<th>Underlying Statute or Regulation</th>
<th>Permit/Approval</th>
<th>Regulated Activity</th>
<th>Other Related Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Fish and Wildlife Service</td>
<td>Endangered Species Act 16 U.S.C. § 1531 et seq. (1973)</td>
<td>Section 7 Consultation - and/or - Section 10 Incidental Permit - and/or – Safe Harbor Agreement</td>
<td>Potential impacts to federally-listed species, species proposed for listing, and/or designated Critical Habitat of such species.</td>
<td>Biological Opinion (Section 7) Habitat Conservation Plan (Section 10)</td>
</tr>
<tr>
<td>NOAA Fisheries</td>
<td>Endangered Species Act 16 U.S.C. § 1531 et seq. (1973)</td>
<td>Section 7 Consultation - and/or - Section 10 Incidental Permit - and/or – Safe Harbor Agreement</td>
<td>Potential impacts to federally-listed marine and anadromous species, species proposed for listing, and/or designated Critical Habitat of such species.</td>
<td>Biological Opinion (Section 7) Habitat Conservation Plan (Section 10)</td>
</tr>
</tbody>
</table>

**State and Regional Agencies**

<p>| Central Coast Regional Water Quality Control Board | Clean Water Act 33 U.S.C. §1251 et seq. (1972) | Section 401 Water Quality Certification | Required for actions that trigger a Clean Water Act Section 404 permit (see above) to certify that a discharge will | CEQA compliance |</p>
<table>
<thead>
<tr>
<th>Regulatory Agency</th>
<th>Underlying Statute or Regulation</th>
<th>Permit/Approval</th>
<th>Regulated Activity</th>
<th>Other Related Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Coast Regional Water Quality Control Board</td>
<td>Clean Water Act 33 U.S.C. §1251 et seq. (1972)</td>
<td>National Pollution Discharge Elimination System Permit</td>
<td>Point sources that discharge pollutants into Waters of the US.</td>
<td>NEPA and CEQA compliance</td>
</tr>
<tr>
<td>Central Coast Regional Water Quality Control Board</td>
<td>Porter-Cologne Water Quality Control Act (CA Water Code Section 7)</td>
<td>Waste Discharge Requirement</td>
<td>Activities, discharges, or proposed activities or discharges that could affect California's surface, coastal, or ground waters.</td>
<td>CEQA compliance</td>
</tr>
<tr>
<td>Regulatory Agency</td>
<td>Underlying Statute or Regulation</td>
<td>Permit/Approval</td>
<td>Regulated Activity</td>
<td>Other Related Approvals</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>----------------------------------</td>
<td>-------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Central Coast Regional Water Quality Control Board</td>
<td>Construction General Permit Order 2009-0009-DWQ</td>
<td>Construction General Permit</td>
<td>Dischargers whose projects disturb one (1) or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres.</td>
<td>Development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer (QSD).</td>
</tr>
<tr>
<td>California State Lands Commission</td>
<td>CA Code of Regulations Chapter 1 (State Lands Commission), Division 3 (State Property Operations), Title 2 (Administration)</td>
<td>Lease agreement</td>
<td>Portions of the project located within Public Trust lands (the beds of tidal and navigable waters acquired at statehood in 1850)</td>
<td>CEQA compliance</td>
</tr>
<tr>
<td>California Coastal Commission</td>
<td>California Coastal Act (PRC Division 20)</td>
<td>Coastal Development Permit Appeal Authority, Letter of concurrence with CWA Section 404 permit.</td>
<td>Activities that affect land or water uses or natural resources of the coastal zone must be reviewed for consistency with the California Coastal Management Plan (CCMP).</td>
<td>CEQA compliance</td>
</tr>
<tr>
<td>California Department of Fish and Wildlife</td>
<td>Section 1602 of the California Fish and Game Code</td>
<td>Lake and Streambed Alteration Agreement</td>
<td>Initiation of any construction project that will: 1) substantially divert,</td>
<td>CEQA compliance</td>
</tr>
<tr>
<td>Regulatory Agency</td>
<td>Underlying Statute or Regulation</td>
<td>Permit/Approval</td>
<td>Regulated Activity</td>
<td>Other Related Approvals</td>
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</tr>
<tr>
<td>California Department of Fish and Wildlife</td>
<td>California Endangered Species Act (California Fish and Game Code Division 3, Chapter 1.5)</td>
<td>Section 2081(b) (Incidental Take Permit)</td>
<td>obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; 2) use materials from a streambed; or 3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake.</td>
<td>n/a</td>
</tr>
<tr>
<td>State Historic Preservation Office</td>
<td>National Historic Preservation Act of 1966 (16USC470)</td>
<td>Section 106 Compliance</td>
<td>Required for actions that trigger a Clean Water Act Section 404 permit (see above) to ensure federal agencies</td>
<td>Consult Tribal Historic Preservation offices (THPO)</td>
</tr>
</tbody>
</table>
Permitting Discussion

Federal Agency Permitting

The Rivers and Harbors Act of 1899, Section 10 is meant to protect the navigable waters from development, construction, and excavation. The act prohibits unauthorized alteration of navigable waters. Navigable waters are defined as “waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce” (River and Harbors Act of 1899, Section 10-NOAA). Section 10 goes a bit further by also protecting the continental shelf.

Section 404 Clean Water Act: Section 404 is a common permit required from the US Army Corps of Engineers (USACOE) under the Clean Water Act. It is very likely this project will require one. A section 404 permit is required before any point source discharge of fill or dredged material into Waters of the US. While the EPA may veto any 404 permit, this rarely happens. It is very likely that this project will result in the creation of permanent fill in Water of the US due to the creation of various infrastructure across or through streams and the ocean (the waters in question will qualify as Waters of the US). There are three types of 404 permits. The first is called a Regional General Permit (RGP) which is the simplest and quickest permit, but is given out in limited circumstances. The RGP is given mainly for common, maintenance type projects that will have limited environmental impacts. It includes pre approval from the Regional Water Quality Control Board (RWQCB) for a Clean Water Act Section 401 permit and pre approval from the US Fish and Wildlife Service (USFWS) and NOAA Fisheries for Endangered Species Act consultation as well. The next kind of 404 permit is called a Nationwide General Permit (NWP). These authorize broad categories of activities that could cause minimal impacts (less than 0.5 acres) and are reauthorized every 5 years. There are numbered standard categories for NWP’s include certain projects. The last kind of 404 permit is an Individual Permit (IP). These are required for projects with larger impacts (greater than 0.5 acres) in areas under
USACOE jurisdiction and do not fit in a NWP category. Individual Permits are the most time consuming and costly 404 permit because they require a full NEPA analysis. Each 404 permit contains general conditions that apply to the permitted activities. Further, each 404 permit requires prior approvals before being issued. These include NHPA Consultation under section 106, consistency with CZMA, RWQCB 401 Permit (for NWP and IP), and consultation under the federal Endangered Species Act. Determining which 404 permit is required will require further analysis once a more comprehensive project description and construction plan has been completed.

The Endangered Species Act (ESA) is necessary to address and file permits because actions taken during the development of the project, as well as post completion impacts, pose potential violations under CEQA. Both the US Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) have responsibilities under the ESA. NOAA must conserve and protect fish and marine wildlife that have been identified as threatened or endangered. The USFWS deal with other species that are not marine such as insects, flowering plants, and birds. A relevant ESA section is section 7 which involves a federal nexus, so federal agencies such as the US Army Corps, USFWS, or NOAA must be involved to understand the project and impactful actions. Different agencies may have minor jurisdiction over the project site such as the US Army Corps may have some say over wetlands, but not majority of the area. Section 10 of the ESA must also be considered and are necessary for the protection and conservation of the threatened and endangered species protected by the act. Unlike section 7, there is no federal nexus or mandated time limit for section 10. Section 10 expressively authorizes mitigation efforts to the maximum in order to prevent the impact upon federally listed species. A habitat conservation plan (HCP) would need to be written and approved as part of the process. A HCP would contain an impact assessment as well as alternatives to adverse impacts upon the evaluated species. Three permits are necessary for filing under the ESA, Incidental take permits, Enhancement of survival permits, and Recovery and interstate commerce permits. A HCP is required to accompany an Incidental Take permit. A No Surprise assurance can also be given under section 10 that says the USFWS will not require additional commitments from the applicant if an “unforeseeable event” occurs (USFWS, Habitat Conservation Plans). A consultant should be hired to help maneuver between the many options and section of the ESA in order to select the best path for the project while following the law.

The Safe Harbor Agreement (SHA) on the West Coast is a voluntary activity that benefits federally threatened species as well as the landowners. The restoration aspect of the project would possibly trigger this agreement since impacted species would benefit after the project is completed. Benefits to meeting conservation standards is regulation flexibility for other permits or laws. For example, a small incidental take prohibited by the ESA would be allowed since the species overall would benefit from the project. A SHA is an example of an Enhancement of survival permit mentioned in the paragraph above.

**State and Regional Agency Permitting**

Section 401 of CWA focuses on making sure any discharging activities into US waters is within water quality levels for the state. The request for a 401 certification must be fulfilled "within a reasonable period of time" in order to get the permitting process going. Such regulations to
comply with are water quality standards, effluent limitations, new source performance standards, and toxic pollutants (Overview of CWA 401 Certification, EPA).

The 1972 amendments to the federal Water Pollution Control Act established the National Pollutant Elimination System (NPDES) permit program to control discharges of pollutants from point sources. USEPA has granted the State of California (the State Water Board and Regional Water Boards) primacy in administering and enforcing the provisions of CWA and NPDES. NPDES is the primary federal program that regulates point-source and nonpoint-source discharges to waters of the United States. A NPDES permit is required because the installation of the pipelines would stir up rock, sand, and other debris, and could potentially release wastewater in the surrounding areas, including the Pacific Ocean. The applicant would need to get an individual permit because an individual permit is tailored to a specific facility using the nature of discharge, type of activity on site, and the current receiving water quality.

The Ocean Plan by the Central Coast Regional Water Quality Control Board (RWQCB) controls the discharge of waste into ocean waters such as stormwater runoff, municipally treated sewage outflow, and other industry permitted discharges. The control plans are reviewed by the nine regional boards to make sure plans are keeping up with policy changes, new technologies, and environmental settings. The public and stakeholders with interest in a plan are allowed to give input into the plans although authoritative power is at the RWQCB, specifically the Central Coast RWQCB for this project (Ocean Plan Fact Sheet, State Water Board).

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is established and implemented by the State Water Board and nine Regional Water Boards. The Act requires projects that are discharging, or proposing to discharge, wastes that could affect the quality of the state’s water to file a waste discharge report with the appropriate Regional Water Board. The Porter-Cologne Act also requires that the State Water Board or a Regional Water Board adopt basin plans for the protection of water quality. The project area lies within the jurisdiction of the Central Coast Regional Water Quality Control Board. Under the Porter-Cologne Water Quality Control Act, the Central Coast Regional Water Quality Control Board has the authority to conduct, order, and oversee investigation and cleanup where discharges or threatened discharges of waste to waters of the state could cause pollution or nuisance, including impacts to public health and the environment.

A Construction General Permit would be needed since the construction of the pipelines disturbs one or more acres of soil and emits discharge (rock, sand, wastewater, etc.). Construction activities that disturb 1 acre of land or more are required to obtain coverage under the General Permit for Construction Activities. The Construction General Permit requires the applicant to file a notice of intent to discharge stormwater and to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP includes a site map and a description of proposed construction activities, along with a demonstration of compliance with relevant local ordinances and regulations, and an overview of the best management practices (BMP) that would be implemented to prevent soil erosion and discharge of other construction-related pollutants that could contaminate nearby water resources. Permittees are further required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater related pollutants. Clearing the area and digging out material to put the pipelines in all activities subject to a construction general permit.
The California State Lands Commission manages “4 million acres of tide and submerged lands and the beds of natural navigable rivers, streams, lakes, bays, estuaries, inlets, and straits” (About the California State Land Commissions). These lands are often referred to as Public Trusts. Such lands go out 3 miles offshore from the Pacific Coast. One way the Commissions protects the lands is by issuing lease agreements during development.

The California Coastal Commission (CCC) is responsible for protecting and enhancing the coastal areas for present and future generations. Development activities in need of permit approval are triggered by construction, but also by a shift of intensity of water or land use even in the face of no construction. In the case of permitting, the commission certifies a Local Coastal Program (LCP) which can be reviewed by the city or county. However, the CCC still has responsibilities since it has appellate authority and jurisdiction over specified land. The CCC must also assist at identifying and protecting wetlands, causing the need of agreement for the CWA Section 404 permit.

Section 2081 of the California Fish and Game Code California Endangered Species Act: Incidental Take Permits are needed for the many listed species identified by California. A total of 173 animal taxa and 286 plant taxa were identified as special status species. Some of the species overlap the federally recognized endangered or threatened species by the ESA such as the California Red-Legged Frog (*Rana draytonii*), Vernal Pool Fairy Shrimp (*Branchinecta lynchi*), and La Graciosa Thistle (*Cirsium loncholepis*). Both the federal and state government must be contacted about impacts to listed species, even if it’s the same species, since both entities might have differing solutions to incidental takes. The state and federal government define endangered species, threatened, and takes differently. The CESA is under the California Fish and Game Code and defines endangered species as those that are in serious trouble of becoming extinct due to disease, overexploitation, habitat loss, predation, and other activities. Threatened species are those likely to become endangered if no protective action is taken.

There is no definition of an incidental take, although there are prohibitions against takes of listed species, so the federal definition rolls over (USFWS, CESA to federal Endangered Species Act). Incidental takes are common during construction and utility projects, so the project should apply for this permit. An assessment and minimization measures should be included when applying for the permit. Section 2089 California State Safe Harbor Agreement (SHA) Program Act under the California Fish and Wildlife Code protects the threatened and candidate species under the California Endangered Species Act. In order to protect all of the listed species. A Safe Harbor Agreement under the federal government and state government would be needed. Similar to the ESA and CESA, different agreements may be met by the federal and state governments. There may be disagreements over what low level “takes” are for an overlapping listed species so a federal and state SHA should be made. A Consistency Determination is filed for dual listed species and once the form is filed. Consultation can help the applicant explore how to best protect the land and species while allowing the project to be completed.

Permits under Section 1602 of the Fish and Game Code will be needed for the restoration of Little Oso Flaco Creek. This statute states that a permit is required if there will be any substantially change or use any material from the bed, channel, or bank of, any river, stream. Although this is a restoration project and will enhance the nature of the creek, there will still be a significant change to the current baseline.

The State Historic Preservation Office (SHPO) strives to protect the nation’s heritage from rapid development. Section 106 specifically grants legal status to historic preservations during times
of planning, decision making, and project developments. Therefore, effects on historic properties must be acknowledged and a statement must be released if impacts are to occur describing the decisions to develop (Section 106, NCSHPO).

**Timing of Permits**

The Rivers and Harbors Act requires NEPA compliance in order to occur. Therefore, requirements for NEPA must be approved before the Section 10 permit may be released. The timing of this permit shouldn't be too long due to the need of one approval before hand.

Section 404 of the Clean Water Act requires compliance with several other permits. Which permits in specific will depend on which one of the three different 404 permits the facility will require. Given the complexity and overall scale of the project, it is likely that the project will require an individual permit. This means a full NEPA analysis will need to be conducted first, a 401 permit from the RWQCB will be required, and compliance with the Endangered Species Act, the CZMA, and section 106 of NHPA will be required. This means that this permit will likely come at the backend of the permitting process because there are other permits and a full NEPA analysis that will need to be done.

Permits occasionally need approval after steps have been taken through the County process such as NEPA and CEQA. For Sections 7 and 10 of the Endangered Species Act, there needs to be NEPA compliance. Section 7 requires the formation of a biological opinion after the agency undergoes consultation. NEPA evaluation of biological resources should also occur concurrently in order to verify that the biological opinion aligns with the NEPA results. Section 10 must also be in compliance with NEPA when creating the Habitat Conservation Plan. The US Fish and Wildlife Service is responsible for verifying NEPA compliance, and assist the applicant through conservation steps. Section 10 will take longer than section 7 since writing and approval of a habitat conservation plan under the Endangered Species Act will take time. Section 10 does not have a mandated time limit so section 10 approval may take years. Alternatively, Section 7 has a time limit of 135 days once formal consultation has occurred.

The Safe Harbor Agreement on the West Coast can speed up the process of construction and permitting since small “takes” or other low impact prohibitions may be allowed. For example, a plan can be agreed upon through the Safe Harbor Agreement that allows for one accidental take of the California red-legged frog as long as their habitat is improved after the project’s completion. By agreeing to this plan, if one frog is accidentally harmed, construction can continue as long as the project doesn’t break the rules of the agreement. Gaining an agreement can take a while based on how long the NEPA documentation is taking. Generally, Safe harbor agreements are meant to expedited the permitting process, so once compliance with NEPA is confirmed, the agreement should quickly occur. This is similar to the state level California Safe Harbor Agreement section 2089 since pre approval is in alliance with the federal Safe Harbor Agreement. A Consistency Determination is the last approval needed for the federal and state SHA to be active (USFWS, Safe Harbor Agreements).

The NPDES permit, which is regulated under the Clean Water Act, must be in compliance with NEPA process. The National Pollutant Discharge Elimination System permit is under national jurisdiction, but also must meet the standards of the California State Water Control Board. Since the permit needed is an individual permit (not a general permit), it will take longer to obtain it.
This permit will also require more time since it must be obtained before main construction begins so the pipelines are able to be built.

The Ocean Plan will require both CEQA and NEPA compliance. Also, the Ocean Plan will need to be reviewed for approval. Therefore, this plan may take a couple years to verify appliance and review, but not as long as other permits such as the CWA sections.

The Waste Discharge Requirement and Program permit will take a longer time to obtain, as it deals with discharges into waterways and the California Coast. Although the project would not be subject to the California Code of Regulations, finding out which program works for the project’s construction would also take some time. Full CEQA analysis would need to be conducted first to determine which waterways are being directly impacted, before the permit and program is approved.

The Construction General Permit, under the Porter Cologne Water Quality Control Act, won’t require as much time as the other permits, but it will require a specialist. The permit being obtained is under the regional water quality control board, and the aspect of the permit that takes the most time is getting a qualified SWPPP developer to create a Storm Water Pollution Prevention Plan.

The State land commissions requires CEQA compliance, although the lease agreement process is meant to go quickly. There is an online application form in order to expediate the agreement process.

The CCC will verify the CWA section 404 permit follows CEQA guidelines, but otherwise does not need an immense amount of time to concur with the permit. The Coastal Development Permit will also not take an immense amount of time since the CCC must deliver an answer in a reasonable period of time.

The California Endangered Species Act must be in compliance with the CEQA process. Section 2081 Incidental Take permits cannot be given until the necessary CEQA steps are taken such as approval of the CEQA draft. Therefore, construction cannot occur before the Incidental Take permits are approved which must follow the approval of CEQA documents. This permit may take a while to get since the CEQA process must occur beforehand.

SHPO does not require CEQA or NEPA compliance but should consult with THPOs to verify tribal opinions. Consultations can vary in time needed since topics may be controversial among agencies and offices.

### CEQA Process

General definitions of agencies must be identified in order to fully understand the CEQA process. First off, there is the applicant. The applicant is the one that will go to a lead agency to start and fund the project. A lead agency is the principal agency responsible for the project and preparation of EIR documents. Hired firms may help the Lead Agency through the CEQA process. For the case of this project, the Lead Agency would likely be the County of San Luis Obispo. Responsible agencies include any state or local agencies that have discretionary power over the project. Therefore, responsible agencies need to be included and active in the CEQA process. Responsible agencies rely on the environmental information in the Lead Agency’s document for project approval, although responsible agencies can lead studies for their own
findings. Trustee agencies are agencies with jurisdiction by law over natural resources impacted by project implementation. Trustee agencies must be notified about advances in the project. The four examples of trustee agencies are the California Department of Fish and Wildlife, California State Parks, California Land State Commission, and University of California. The State Clearinghouse is an important player in coordinating the distribution and review of CEQA documents with local governments, organizations, and agencies. Interested group and individuals can vary to an everyday person that lives around the Nipomo Mesa to an organization like Friends of the Oceano Dunes (Aspen Environmental Group).

For further definitions, reference Statute 21050 of the 2021 CEQA Statute and Guidelines book which is under chapter 2.5 “definitions”. This resource also has other valuable chapters such as chapter 3 “Guidelines for implementation of the California Environmental Quality Act as amended December 28, 2018.” Chapter 3 was summarized below with further details referenced in Appendix C - CEQA Process Details.

**Phase 1**

The first phase of the CEQA process is generally defined by the work needed before any drafting of an EIR can begin. Therefore, such steps are the Notice of Preparation, a kickoff meeting, and further scoping. A Notice of Preparation should be started as soon as it’s decided that an EIR is needed. Therefore, criteria such as a defined project must be approved. Once the project description has been released, a kickoff meeting would occur. A kickoff meeting is held in order to present the vision of the project to the public. Scoping meetings would be held to clarify any contents of the EIR. Additionally, environmental information that may be of public interest would also be shared. Multiple meetings would be held after the kickoff meeting to answer questions and further present progress or information about the project.

**Phase 2**

The second phase focuses on the Administrative Draft EIR (ADEIR), Public Review Draft EIR, Public Hearings, Notice of Completion and Notice of Availability. CEQA requires that before a decision can be made to approve a project with potentially significant environmental effects, an Environmental Impact Report must be prepared to fully describe potential environmental effects of the project. An EIR is a public information document for the use of government agencies and the public to analyze the potential for negative impacts on the environment, recommendations for mitigation measures to lessen or eliminate adverse effects, and to examine feasible alternatives to a project. The information comprised in the ADEIR will be reviewed by the governing body prior to the final decision to approve, disapprove, or modify the project. The ADEIR includes many important sections as outlined in Appendix C.

The Public Review Draft EIR accepts comments from agencies and the general public in order to further revise the report. All comments should be read and reviewed. Lead Hearings should also occur to further present to the public information about the project, what the current plan of action is, and gather more comments or concerns about the project. The Notice of Completion is released after the draft EIR is completed. The Notice of Completion will include the project description, project location, availability of related documents, and clarify when and where the public hearings will be held. The Notice of Availability will also be written to further define the project and be sent to interested parties.
Phase 3

The third and final phase consists of the Administrative Final EIR, Final EIR, lead agency hearings, decision documentation, and Notice of Determination. The Administrative Final EIR would be written and includes the draft EIR, responses to public comments, and relevant appendices. This report would be sent out to all agencies involved in the proposal. The administrative final EIR would also be sent to the county of San Luis Obispo to undergo a county review period. After the county review period, a general circulation of the EIR document would occur. The review period should be long enough to allow each agency to read it and respond with comments. The Final EIR will then be written, released, and recirculated into the public. Lead agency hearings will be held to certify the Final EIR and go over final information.

The decision documentation is focused around the CEQA findings, mitigation and monitoring programs, and any additions of relevant statements of overriding conditions. The CEQA Findings will be the majority of the EIR writing, with each environmental issue area having existing conditions described as well as what kind of impacts may occur as a result of the project. These come from the Appendix G of the CEQA manual. Methodology of how the impacts were determined would also be detailed. A corresponding mitigation and monitoring program should accompany each environmental issue area. Finally, a statement of overriding conditions can be written if the project finds that there are economic or social benefits that will occur and outweighs the environmental impacts. A Notice of Determination must be approved to acknowledge that the CEQA process and requirements were met.
Figure 5.2: Flowchart and timeline of CEQA and permitting processes for the project.
6 Summary of Findings

The environmental issue areas have map layers created to explore the project site. The parcel data was created by students in the class from the San Luis Obispo County Land Use View as well as the map given from the client emails. The refinery footprint was determined from the National Land Cover Database. Majority of the remaining data layers were retrieved from the San Luis Obispo County GIS hub.

![Map of Environmental Constraints](image)

**Figure 6.1:** A summary of constraints map with relevant environmental issue area data layers.

Environmental areas included on the map are biological, hydrology, geology, and aesthetics. These layers were added since construction and operation must be planned around these sources due to the potential impacts to the resources. Environmental conditions not included are air testing stations, scenic vistas, and archaeological sites due to the lack of issues near the site. For example, the scenic vista is more northern than the site, so they were not included in this overall summary map.

The map can be used to define the locations of environmental constraints in order to assist in where to construct infrastructure. The best pathway for the intake and outfall pipelines can be determined as well as the roads and powerlines needed to connect the plant to the city. The map should serve as an overall source of possible environmental impacts on or around the project site for further decision making.
Assumptions for the Project

The project components essential for this report were broken into three parts with a number of assumptions made. The decommissioning aspect is not explored in the analysis since this would likely not be the problem of the client. This would be the responsibility of the refinery or other entity. The desalination construction can be broken into many steps. Many types of equipment and technology can be used for these steps, so alternatives are explored. It was decided that the desalination plant will use a reverse osmosis system since it is the most popular option among other desalination plants researched. Reverse osmosis can reduce energy usage compared to other alternatives and can easily vary in size to accompany the size of the plant. Another assumption is that the best method for concentrate management is submerged discharge. Submerged discharge is also a popular method used by other desalination plants since the water is transported through underwater pipes away from the plant site and sensitive resources. Finally, the proposed location or extent of freshwater distribution pipelines was not explored. Connecting freshwater pipelines becomes a much bigger project and is easily outside of our expertise as students. The third and final component of restoration was assumed to focus on removal of over-stabilizing invasive vegetation as well as fencing to protect the planting of native vegetation for dune habitats. The Little Oso Flaco Creek restoration would be based off the USDA guidelines for stream restoration which would include identifying problems, inventory, resource analysis, formulating alternatives, and implementing a plan to name a few steps. Strategies have begun to be formulated for Little Oso Flaco Creek specifically such as filter strips, vegetated waterways, and vegetated retention ponds and basins as recommended by the Coastal San Luis Obispo Resource Conservation District.

Summary of Regulatory Findings

Based on the potential environmental impacts to each of the issue areas, multiple permits and approvals will be necessary for the implementation of the proposed project. A comprehensive list is provided below:

Federal

- Section 4 of the Endangered Species Act
- Section 7 of the Endangered Species Act
- Section 10 of the Endangered Species Act
- Safe Harbor Agreement on the West Coast of the Endangered Species Act
- Section 404 of the Clean Water Act

State

1. Section 401 of the Clean Water Act
2. Water Discharge Requirement of the Waste Discharge Requirement Program
3. Construction General Permit of the Porter Cologne Water Quality Control Act
4. NPDES Permit of the Clean Water Act
5. Section 2089 Safe Harbor Agreement of the California Fish and Game Code
6. Section 2081 Incidental Take of the California Fish and Game Code and the California Endangered Species Act
7. Section 1602 Lake and Streambed Alteration Agreement of the California Fish and Game Code
7 List of Preparers

Ethan Duffy is completing his Bachelor of Science degree in Environmental Management and Protection at California Polytechnic University in San Luis Obispo. Through his scholastic endeavors, he has studied soil science, botany, watershed management, water law, environmental law, and ecosystem management. While living in San Luis Obispo during his college years, he was heavily involved in the community and aided in local business growth by doing photography work and art direction. Upon graduating, Ethan will continue working creatively with local businesses and use his environmental degree to be a community advocate for environmental rights with hopes of one day forming a non-profit that uses mycofiltration to aid in ocean habitat restoration.

Tyler Gibello is a third year student completing his Bachelor of Science degree in environmental Management and Protection with a minor in Law and Society at California Polytechnic State University. Throughout his time at Cal Poly he has studied life cycle analysis, water law, constitutional law theory, and water system resiliency. This mixture of coursework has lead to a desire to understand and work to improve humanity’s interaction with natural systems and how these interactions effect both human physical and mental health. Outside of school, he has been an active member in his community and a member of the Education Team at the Cal Poly Surfrider chapter. This summer he will be interning with Clean Harbors in San Diego, CA working as an Environmental Compliance Specialist and overseeing the collection, proper disposal of, and/or re-refining of spent industrial petroleum products.

Alexis Huynh is a third-year student completing her Bachelor of Science degree in Environmental Management and Protection and minoring in Geographic Information Systems at California Polytechnic State University in San Luis Obispo. Through her academic coursework, she has studied natural resource ecology, watershed management, ecosystem management, and environmental law and policy. She is familiar with synthesizing information by analyzing collected field data and conducting research in topics such as watershed health and habitat management. While living in San Luis Obispo, Alexis was also active in public and community outreach as a Zero Waste Ambassador volunteer at Cal Poly alumni and sports events. She will continue working on community engagement in sustainability as a Recycling Education Outreach Intern at Waste Management this summer.

Anna Lockwood is finishing her Bachelor’s of Science degree in Environmental Management and Protection at California Polytechnic State University: San Luis Obispo. Throughout her years at Cal Poly, she has taken soil science, hydrology, biology, agroecology, life cycle analysis, bioresource engineering, and many environmental law and business courses. She is experienced in organic farming, analyzing soil and water samples, wildfire management, and determining potential emission/pollution solutions for businesses going green. She was heavily involved in her school community through the Real Food Collaborative, Surfriders, and Zero Waste Club. She decided to graduate a year early from Cal Poly to pursue her ambition of
serving her country through the U.S. Coast Guard to implement marine pollution regulations around the world.

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**Jack Manca** is finishing his Bachelor’s of Science degree in Environmental Management and Protection with a minor in Biology at California Polytechnic State University: San Luis Obispo. Through his interdisciplinary studies, Jack has taken soil science, geology, botany, chemistry, ecosystem management, environmental law, and a plethora of biology courses. He is familiar with field studies conducting soil analysis, measuring ecosystem health and biodiversity, and identifying local plant and animal species. Jack has worked with non-profits aimed at ocean plastic pollution, including Plastic Tides, and has experience with landscape design and forest management. He hopes to continue his environmental studies and conduct conservation field work through Americorp in the coming years.

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**Jesse Stewart** is finishing her Bachelor’s of Science degree in Environmental Management and Protection with a minor in Geographic Information Systems at California Polytechnic State University: San Luis Obispo. Through her interdisciplinary studies, Jesse has taken botany, ecology, watershed protection, and conservation biology. She is familiar with field studies from conducting benthic macroinvertebrate evaluations, identifying native oaks in San Luis Obispo county, and proposing conversation plans for Tree Kangaroos. Jesse has been to Swanton Pacific Ranch in Santa Cruz county where riparian vegetation was assessed, buffers were introduced, and redwood plots were evaluated for Douglas fir trees post CZU fire. Jesse has created maps for watershed riparian conditions, California red-legged frog sanctuaries, and channel habitat identification through ArcGIS programs. Jesse has knowledge about environmental policies such as the Endangered Species Act, Clean Water Act, and the CEQA process. Jesse has interned as an education manager at the Chula Vista: Living Coast Discovery Center where she researched and analyzed the impacts of urbanization on the Sweetwater Marsh in the San Diego National Wildlife Refuge.
Appendices

Appendix A- Local Permitting

Land Use Ordinance Title 23

Zoning clearance is required for all new projects in compliance with the already standing buildings and activities. If construction permits are required, a zoning clearance would be processed and approved by the construction permit application and process. There are three situations where business license applications need to be cleared from zoning, which are proposing a new business, involve a change of use in an existing structure, or renew a license for a business using leased off-site parking. The business license applications must meet the requirements reviewed by the Planning Director through use, structure, operational standards, and violation. Approval of zoning clearance for a new business through an already existing structure is subject to zoning requirements of parking and signing. Any new uses of building or structure will require clearance for landscape, fencing and screening, as well as site development standards.

The Plot Plan context must include a site layout plan including the following descriptions:

1. Site location and dimensions
2. Road access and street improvements
3. Buildings and structures
4. Easements
5. Utilities
6. Site Improvements
7. Landforms
8. Additional information *the following requirements are for specific cases and projects
   a. Drainage plan
   b. Grading plan
   c. Planning area requirements
   d. Sign information
9. Special standard requirements
10. Solid waste disposal information
11. Trees

Ownership verification is needed for the Plot Plan, and the plan should be made known to the public. The Planning Director will approve the Plot Plan if proposed project satisfies all the applicable provisions and stipulations of the title. If a Plot Plan is not approved, the applicant can submit an appeal to the Coastal Commission.

Minor Use permits should include all of the provisions from the Plot Plan permits, as well as include the following: preliminary floor plan, architectural elevations, adjacent land use information, landscape plan, contour map (including outside and inside urban reserve lines as well as areas with more than a 30% slope), supplementary development statement, reduced drawings, public access locations, cross-section drawings, and a mailing list. In order for a minor use permit to be approved, the Planning Department must find environmental determination reviewed by CEQA guidelines, where they can find that 1) a statement from the Environmental Coordinator that the project is exempt from CEQA 2) approval of a negative
declaration by the decision-making body pursuant to CEQA or 3) certification of a final EIR. An application can be subject to a public hearing, where they either follow the regular agenda or the consent agenda. If a project has a regular agenda, a Tentative Notice of Action must be prepared. The Notice of Final Action must be prepared within seven days of the administrative hearing and the expiration of the time period for appeals to the Planning Commission or the Board of Supervisors.

The Development Plan required findings include: the proposed project is consistent with Local Coastal Program and the Land Use Element, the project satisfies all provisions of the title, the project will not generate an unsafe volume of traffic on roads that accessible to the project, the proposed use is in conformity with public access and recreation policies through the California Coastal Act. When all of the approval of the permits have been determined, there is a Notice of a Final County Action, Notice of Failure to Act, and a finality of county action.

*South County Coastal Area Plan*

Union Oil was issued the coastal development permit 409-24 which provides an easement on the property for habitat preservation and public access. Ecological restoration remains a goal of the project so this should not be a conflict.

There are a series of permit requirements and standards that apply to the area currently occupies by the Santa Maria Refinery and the Santa Maria Chemical Plant. As stated above, much of these requirements assume that modifications to the refinery are not a total decommissioning of the refinery.

1) Permit Requirements: Any proposed modification to the refinery requires Development Plan approval which is subject to the following requirements.

- Phasing plan for staging development which includes a time table, site plans, and project goals
- Approved fire protection system
- Nonreflective paint colors that blend with the surrounding landscape for parts of the facility that cannot be screened by the above methods
- Oil spill contingency plan

2) Limitations on Use: All uses are prohibited except petroleum refining and related industries

3) Site Location: The site location will minimize impacts to identified rare and endangered plant species and a buffer will be in place between the site and exposed dunes areas. A qualified biologist will have to provide mitigation measures.

4) Buffer Zones: No facilities can be located west of the railroad. The buffer area will be managed by the property owners and the California Department of Parks and Recreation.

5) Air Pollution Standards: Any changes made have to meet the San Luis Obispo County Air Pollution Control District standards.
Appendix B- Additional Applicable Laws

Federal

Bald and Gold Eagle Protection Act

The act prohibits the taking of birds that are specifically bald or gold eagles. A “take” is the harming, killing, transporting, selling, and other disturbing practices towards birds of any age. Therefore, eggs, nests, chicks, and adult birds cannot be taken. No part of a bird may be taken either (USFWS).

Birds of Conservation Concern (BCC)

The BCC is a mandate that identifies species and populations of nongame birds that may become candidates for the Endangered Species Act if no efforts to protect or conserve the birds are taken. Nongame birds, birds without permitted hunting seasons, and proposed or recently removed species from the Endangered Species Act are also considered in this mandate (USFWS).

Clean Air Act

EPA sets limits on certain air pollutants, including how much can be in the air at any given time in the United States. This act also gave the EPA the authority to limit emissions from specific sources. These sources include radiation, stationary sources, mobile sources, and haze.

Ecological Services Program

Landscapes, animals, plants, and fish are protected through this program by active use of the Endangered Species Act. Professionals help map, evaluate, recover, and advice projects that may or have impacted environments (USFWS).

Federal Antidegradation Policy:

The Federal Antidegradation Policy requires states to develop statewide antidegradation policies and identify methods for implementing them. Pursuant to the Code of Federal Regulations, state antidegradation policies and implementation methods must, at a minimum, protect and maintain (1) existing in-stream water uses; (2) existing water quality, where the quality of the waters exceeds levels necessary to support existing beneficial uses, unless the state finds that allowing lower water quality is necessary to accommodate economic and social development in the area; and (3) water quality in waters considered an outstanding national resource.

Federal Coastal Zone Management Act

The US Congress passed this act in order to protect, conserve, and when possible, to restore the natural systems of coastal zones. Restoration plans should be made before development begins in order to pick the best alternative to degradation (NOAA).

Marine Mammal Protection Act (MMPA)

The MMPA prohibits the “take” of any marine mammals or products. No marine mammals may be taken from US waters, as well as no US citizen can take marine mammals from the ocean. Transportation, moving, importing, or killing of marine mammals is prohibited (USFWS).
Migratory Bird Treaty Act

This act prevents the taking of birds at any age that are known to migrate. A “take” is the killing, stealing, transporting, or harming of a bird. Authorization is needed if there is the potential of taking of migratory birds (USFWS).

National Wildlife Refuge System

There are currently no national wildlife refuge systems in the project area, yet this program is mentioned since a system for the project area could occur (MIG). The goal of the program is to create networks of land and water for conservation and restoration of wildlife resources (USFWS).

23 USC 109 of NEPA

This section focuses on long term planning of highway systems and directs final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values (Council on Environmental Quality).

42 USC 4331 of NEPA

This section of NEPA establishes that the federal government use all practicable and financially viable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing environment. Furthermore, it aims to preserve important historic, cultural, and natural aspects of our national heritage, and maintain wherever possible, an environment which supports diversity and variety of individual choice (Council on Environmental Quality).

State

California Air Resources Control Board

Sets ambient air quality standards for California. Regulations cover a variety of pollutants including carbon monoxide, particulate matter, nitrogen dioxide, sulfur dioxide, and hydrogen sulfide.

California Coastal Act

The California Coastal Act works in conjunction with the Federal Coastal Zone Management Act. The 1,100 miles of California coastline is included as well as the 287 miles surrounding the offshore California islands. The act also goes into the Federal waters determined by the Coastal Zone Management Act. The act protects public access to coastal zones as well as protects natural habitats. Permits and standards are set to verify development will not degrade the coastal lands (Beachapedia).

California Public Resources Code Section 21001[b]

This code establishes that the state government take all action necessary to provide the people of this state with clean air and water, enjoyment of aesthetic, natural, scenic, and historic environmental qualities, and freedom from excessive noise (California Legislative Information).

Total Maximum Daily Load:
A total maximum daily load permit is approved by the Regional Water Quality Control Board, the State Water Resources Control Board and the US Environmental Protection Agency. Once approved, it establishes 1) an allowable amount of a pollutant to a waterbody, 2) proportional responsibility for controlling the pollutant, 3) numeric indicators of water quality, and 4) implementation to achieve the allowable amount of pollutant loading.

**Senate Bill 1467 Sections 260-263**

This bill establishes the State’s responsibility for the protection and enhancement of California’s natural scenic beauty by identifying portions of the State highway system which, together with adjacent scenic corridors, require special conservation treatment (California Legislative Information).

**Local**

**Central Coast Storm Water Program:**

The Central Coast Stormwater Program regulates stormwater discharges from municipalities and construction and industrial activities, to protect, maintain and improve watershed processes affected by stormwater runoff. The Storm Water Program is a National Pollutant Discharge Elimination System (NPDES) Program that requires a phase II municipal separate storm sewer system (MS4) general permit (Order No. 2013-0001 DWQ) to be granted by the State Water Resources Control Board (SWRCB). Phase II “small” MS4 regulations require stormwater management plans to be developed by municipalities with fewer than 100,000 residents and construction activities that disturb 1 or more acres of land. The Statewide Phase II MS4 Permit specifies criteria for site design measures and stormwater treatment measures. MS4 Permits require that cities and counties develop and implement programs and measures to reduce the discharge of pollutants in stormwater discharges to the maximum extent possible, including management practices, control techniques, system design and engineering methods, and other measures as appropriate. As part of permit compliance, these permit holders have created stormwater management plans for their respective locations.

**Groundwater Assessment and Protection:**

The Groundwater Assessment and Protection program (GAP or CCAMP-GAP) is a new and integral component of the Central Coast Ambient Monitoring Program (CCAMP), the Central Coast Regional Water Quality Control Board’s regionally scaled water quality monitoring and assessment program. The purpose of the program is to provide scientific information to Regional Board staff, local water agencies and water purveyors, and the public, to protect, restore, and enhance the quality of the waters of central California.

**San Luis Obispo County Air Pollution Control District (APCD)**

Implement regulations and programs to reduce air pollution and meet air quality standards. Comprised of 12 elected officials.

**San Luis Obispo County Local Coastal Program**

The program was made under the California Coastal Act in order to protect the goals of California Coastal Act. Such goals are protecting public interests in coast lines as well as natural environments among coastal regions. A coastal management process exists to make sure
social, economic, and environmental conditions continue to protect coastal regions (San Luis Obispo county’s local coastal program).

State Parks Habitat Conservation Plan

A draft was made in 2020 to explore how the Pismo Beach and Oceano Dunes district activities affected natural environments, habitats, animals, and plant species in the area. A detailed existing conditions description for the area as well as specific analyses for species such as the Tidewater Goby are available in the plan (MIG).

Strategic Plan

Created by the SLO Air Pollution Control District in 2012. This plan outlines the steps that the county will take in order to meet the goals of the (APCD). The goals of this plan include achieving attainment with state and federal standards, managing toxic air contaminants, ensure air quality from specific land use is addressed, minimize local greenhouse gas emissions, and to enhance public awareness of air quality.
Appendix C- CEQA Process

Phase 1

Notice of Preparation

The Lead Agency will prepare the Notice of Preparation prior to the drafts EIR. The Notice of Preparation will include the project description, location, public hearing information, possible environmental impacts, and how to get access to review documents. Parties such as responsible agencies, trustee agencies, the State Clearinghouse, and interested individuals or groups will be able to comment on the released Notice of Preparation.

Kickoff Meeting and Data Collection

A kickoff meeting will define the project, identify necessary resources, and collect data such data as concerns about the project or what planning documentation is needed. Participants at the kickoff meeting would be the Lead Agency, the County, the Applicant, and hired consulting firm.

Scoping and Consultation

Scoping meetings would generally be run the Lead Agency with attendance by the applicant.

Phase 2

Administrative Draft EIR

The Administrative Draft EIR would contain the following sections:

- Project Description

The project description is a brief summary of the proposed project and its potential consequences. It needs to provide sufficient detail to set a focus for the environmental review process. There are several elements that a project description needs to provide a comprehensive background of all aspects of the project. This includes: a precise location and boundaries of the proposed project area, preferably shown with local and regional scale maps, a statement of objectives sought by the proposed project, a general description of the project’s environmental, technical, and economic characteristics, a statement providing the intended use of the document, and lastly a list of relevant environmental review and consultation requirements mandated by local, state, and federal laws, regulations, or policies.

- Executive Summary

The executive summary provides the broad context for the proposed project and gives an overview of the potential impacts and alternatives. An overview of the Draft EIR Process may be included to ensure any interested parties understand the steps taken. Furthermore, this is where the proposed project is initially introduced through a general summary and all relevant alternatives are also explored. Lastly, a table of impacts and mitigation measures is provided for all CEQA Appendix G issue areas.

- Introduction
The introduction section provides more detail on the organization of the Draft EIR, the approach taken for analysis and mitigation measure, alternatives, and public participation. The scope of the EIR is mentioned and how the process will unfold for the specific proposed project. The analytical steps taken to identify environmental impacts and mitigation measures should be outlined. This section also provides a space to introduce the role of public participation throughout the project. Part of this process includes the discussion of known areas of controversy, issues raised, and areas resolved in the EIR. These issues could be brought forward by the Lead Agency, Responsible Agencies, and the public during the Notice of Preparation and scoping periods.

- Environmental Impact Analysis

This section describes the environmental, social, and cultural resources with the potential to have negative impacts on the current setting as a result of the implementation of the proposed project. Each resource topic should include a description of the regulatory setting, environmental setting, background information about the resource topic, discussion of the criteria used to determine the level of significance of the project’s impacts, discussion of the project’s impact on each specific resource, including the level of significance for each, and lastly recommended mitigation measures to avoid, minimize, or compensate for any significant impacts.

- Cumulative Impacts

The CEQA Guidelines require that a project’s cumulative impacts be discussed when "...the incremental effect is cumulatively considerable..." According to CEQA Guideline Section15065(c), the term cumulatively considerable means "...that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects...." Specifically, CEQA Guideline Section 15355 defines cumulative impacts as: two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or several separate projects. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.

- Growth Inducing Impacts

California Public Resources Code Section 21100 (b) (5) requires that the growth inducing impacts of a project must be addressed within an EIR. A project may be growth-inducing if it directly or indirectly promotes population or economic growth. This could be through the development of additional housing complexes or increased stress to existing community services facilities. The analysis of potential growth-inducing impacts involves a determination of whether a project would remove physical obstacles to population growth. This often occurs with the extension of infrastructure facilities that can provide services to new development, an expansion of a wastewater treatment plant or the development of a reservoir would be examples. Indirect growth-inducing impacts result from projects that promote future development of any kind. It cannot be assumed that growth in any area is going to be necessarily detrimental, beneficial, or of minor significance to the environment.

- Project Alternatives
The purpose of having an alternatives section in an EIR is to identify ways to lessen or avoid any significant effects, should be reasonable and feasible, and should reflect a range of possibilities. The Guidelines require consideration of a “No Project” alternative. The reason for this is to allow decision-makers to compare the impacts of approving the project with impacts of not approving a project. The Guidelines specifically advise that “No Project” is “what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.” The Guidelines emphasize that an EIR should take a practical approach, and not “…create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment.” [Section 15126.6(e) (3)(B)].

Public Review Draft EIR and Lead Agency Hearings

Both agencies and the general public can comment on the Public Review Draft. Public comments can be about any part of the draft EIR, while agency comments are limited to specific sections of the document that the agencies have expertise in. All comments should be considered, even late comments, if possible, when revising the draft. An important source of commentary is from the County regarding the Administrative Draft EIR. A final screening will occur which gives another chance for commentary. The County and consulting firm would review comments and begin the revising of the draft EIR. Additionally, lead agency hearings would occur. Lead agency hearings are held throughout the EIR process, with some occurring during this public review period. Hearings are scheduled by the County generally.

Notice of Completion

The Notice of Completion will be sent to the State Clearinghouse who distributes the draft EIR. Then, comments by state agencies will be provided, sent back to the State Clearinghouse, and returned to the Lead Agency. From these comments, the draft EIR should be further edited and revised.

Notice of Availability

The Notice of Availability will also be released in order to deliver a more in-depth project description, project location, identify significant environmental impacts, clarify public hearing information, inform about document availability, and give a statement of whether the project would occur at a location listed as a toxic or hazardous. The Notice of Availability will be distributed directly to those who have indicated interest in the project, to a general source of media such as newspapers, and through postings in the project area.

Phase 3

Administrative Final EIR

Part of Administrative Final EIR is receiving comments, ordering them relevancy, and responding to comments. Professionals in specific fields can better answer some comments than others, which is why categorizing comments can be beneficial. For example, comments on specific issue areas are common since agencies have specific interests. Therefore, the biological professional may be best fit to answer any comments concerning vegetation or special status species. Relevancy of comments is also beneficial for discovering which comments should lead to EIR revisions. Revisions can vary from rewording paragraphs or conducting more surveys and studies to further collect data.
Final EIR and Lead Agency Hearings

A new public hearing is then set up so that the Final EIR can be certified. The notice of determination is filed within 5 days of the project approval. This notice of determination will also indicate the mitigation efforts that were made and what efforts were both adopted and completed.

Decision Documentation

The following sections pertain to the decision-making process within the phase three portion of the CEQA process and final EIR:

• CEQA Findings

CEQA findings come from the statements of the Appendix G checklist. Looking at all issues related to the impact areas of the project such as the Santa Maria Phillips 66 Refinery conversion to a desalination plant.

• Statement of Overriding Conditions

It is required that the decision-making agency balances the economic, legal, social, or technological benefits of the proposed project against the downfalls of the completion of said project. It is acceptable when the specific benefits previously stated outweigh the negative impacts of the adverse environmental effects brought on by the completion of the project.

When significant impacts are identified in the final EIR by the lead agency, the effects aren’t lessened or avoided. Instead, the agency states the specific reasons to support its action based on the final EIR. The overriding considerations are then supported by the substantial evidence in the record.

After making overriding considerations, these considerations are to be included in the project approval and will be mentioned in the notice of determination.

• Mitigation Monitoring and Reporting Program

Upon recirculating the Final EIR after significant information is newly discovered, public notice is given and the availability of the draft can be reviewed by the public before certification. The latest information is then added to the EIR. It is deemed to be insignificant unless it is changed in a way which deprives the public from an ability to comment on the environmental impacts of the project. This significant information that would require recirculating and monitoring can include a diverse number of concepts like the environmental impact resulting from the project or from a new mitigation measure that is proposed to be implemented. Another outcome is an increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance.

Notice of Determination

The Notice of Determination is filed after it is approved or decided to be carried out on the basis that the project meets the requirements of CEQA. The Notice of Determination will include a brief description of the project as well as what agencies are attached to the project. It is important to state that a negative declaration, mitigated negative declaration, or an EIR was certified in accordance with CEQA.
9 References


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Environmental Constraints Analysis

NIPOMO MESA DESALINATION PLANT PROJECT
DISCLAIMER:

The following document has been prepared as part of the undergraduate curriculum for NR 425 (Applied Resources Analysis and Assessment) at California Polytechnic State University, San Luis Obispo. The intent of this academic exercise was to simulate the real-world process of preparing an environmental constraints and permitting analysis; however, it is important to note that the environmental and permitting constraints identified herein have not been technically peer reviewed by subject matter experts. This document is to be used for informational purposes only.
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1 Introduction

1.1 Project Purpose and Need

With decommissioning the Phillips 66 Santa Maria Oil Refinery in 2023, San Luis Obispo County has multiple options for the next use of this industrially zoned parcel. The Central Coast Economic Recovery Initiative, with enlisted help from Bright, Nielhuson & Welsh Consulting, propose the Nipomo Mesa Desalination Plant Project in conjunction with Little Oso Flaco Lake Restoration. As the Central Coast and all of California is moving towards a much drier climate, the procurement of freshwater resources has become a central theme in the discussion of California’s sustainable future. This project has the potential to ensure sustainable water resources and economic stability for the Oceano area, which is much needed considering the economic fallout from COVID-19. Restoring portions of the Oso Flaco Creek Watershed also has the potential to promote healthier wildlife and dune habitat, which are a main point of attraction for many visitors annually.

The installation of a desalination facility is the most plausible option considering the existing conditions of the site and the resource and economic needs of the area. Desalination would effectively utilize the industrial zoning of the parcel while simultaneously working to meet San Luis Obispo County’s sustainability trajectory.

1.2 Purpose and Scope of Environmental Constraints Analysis

This document will delve into 4 different environmental resources that have the potential to be impacted by the implementation of this project. These include Aesthetics, Air Quality, Hydrology/Water Quality, and Energy. Other environmental issue areas not covered in Bright, Nielhuson & Welsh Consulting’s document are detailed in other consulting firm’s documents, as this project was a class effort. In addition to the resource areas, pertinent land use regulations and regulatory permitting will also be discussed.

Constraints are defined as restrictions that limit a project’s planning process, which can include environmental resource constraints, legal and policy constraints, and permitting constraints. The analysis of these constraints is intended to facilitate the project’s planning process, further define the proposed project, highlight areas of possible potentially significant environmental impacts, and assess potential permitting and mitigation requirements. The site descriptions, constraints analyses, and recommendations entailed in this document are presented solely for the purposes of planning and have not been developed enough for a complete evaluation of environmental constraints.

2 Project Description

2.1 Project Location and Existing Site Characteristics

The Phillips 66 Santa Maria Refinery is located at 555 Willow Rd, Arroyo Grande, CA 93420 in San Luis Obispo County. It is located on a 1,780-acre parcel that is zoned for industrial operations. The Phillips 66 company physical refinery only occupies 200-acres or 11% of the parcel for operations. The company states that the rest of the parcel is used for cattle grazing or open space for wildlife preservation. The refinery was constructed in 1955 and has been in
operation for nearly 60 years. The refinery site runs adjacent to California Highway 101 and is also in close proximity to the Oceano Dunes State Park. The Oceano Dunes are known for their beautiful white sand dunes and off highway vehicle (OHV) recreational areas. The dunes are also habitat for endangered and threatened bird species. Surrounding the Phillips 66 site are several small agricultural parcels and a few commercial industrial sites between the refinery and the highway. Most of the surrounding open space area is controlled by California State Parks. Figure 1 below outlines the land use designations of the parcel area created for the Phillips 66 Project EIR.

The California Coastal Commission (CCC) has stated that after the current permit for the Phillips 66 Santa Maria Refinery expires, they will not be renewing it for continued operation. After 60 years of producing 44,500 barrels of crude oil a day, the refinery will shut down by 2023. This shut down has left a hotly debated argument for what is to be done next with the parcel. Figure 2 below depicts the site facilities of the existing Phillips 66 Santa Maria Refinery.
Figure 1  Land Use Designations
Figure 2 Detailed Site Facilities and Use
2.2 Project Objectives

The project objectives are multifaceted, aiming to address issues in the San Luis Obispo County region spanning from socioeconomic resource issues to environmental issues. This report will identify the environmental constraints associated with all phases of the project after remediation of the site, which is to be completed by the applicant. Specific objectives are as follows:

- Mitigate the impacts of the COVID-19 pandemic on the Central Coast region through economic recovery plan that focuses on clean energy investment, sustainable tourism, and creation of jobs.
- Increase resilience of local economy to withstand future economic shocks through strategies that seek to make the regional economy more economically and environmentally resilient and diverse.
- Utilize the untapped potential of talent and resources in local community through collaboration and inter-agency partnerships.
- Work to resolve the water supply issues of the region through desalination of ocean water.
- Reduce stress on groundwater basins in the region by providing an alternative water source.
- Remediate former refinery site and repurpose refinery facility.
- Preserve habitats and ecosystems located within the project site, as well as the nearby Environmentally Sensitive Habitat Area (ESHA), Little Oso Flaco Creek, freshwater lakes, and Pismo Dune area.

2.3 Project Phases and Components

2.3.1 Phases

This section provides a general overview of the major phases that would be required to repurpose the existing project site and develop and operate a desalination facility. The three primary phases include refinery decommissioning and remediation, desalination plant construction and operation, and environmental restoration. An additional step for project funding, design, and approval would occur before the desalination plant could be built; however, this report will focus on the phases that will affect the physical, biological, and chemical properties of the site.

Phillis 66 Santa Maria Refinery Decommissioning and Remediation

Before any new development can occur on the Project site, the existing Phillips 66 Santa Maria Refinery facility must be decommissioned and remediated. Historically, oil refinery locations have been found to carry large deposits of coal and petroleum in their soils long after the refineries are closed. It is also important to note that groundwater is historically known to be contaminated by oil refineries. Currently, the US Environmental Protection Agency (EPA) has the Phillips 66 Santa Maria Refinery site location listed as one of the locations in their “Cleanups in My Community” and the groundwater migration action is currently listed as “Not
Controlled”¹. This location may potentially need remediation for groundwater resources as well and another preliminary study to analyze the current existing conditions of the groundwater should be performed.

Decommissioning plans need to be prepared and executed alongside environmental permitting authorizations. Planning, engineering, environmental studies and compliance, removing piping, removing platforms, and disposing of waste are major steps in decommissioning an oil refinery (NES Fircroft). For the purposes of this analysis, it is assumed that the decommissioning and remediation process would be completed by the current owner of the property. Addressing the potential environmental impacts associated with the decommissioning and remediation phase is outside of the scope of this report.

Desalination Plant Construction and Operation

Construction and operation of the proposed desalination plant would occur entirely within the existing 183.6-acre refinery facility footprint located on Assessor Parcel Number (APN) 092-401-011 and APN 092-401-005. The location of support infrastructure (e.g., pipelines, transmission lines, etc.) is unknown at this time and should be designed based on the results of the constraints analysis.

The phase of construction is likely the most costly and time consuming phase. Construction is broken up into repurposing the existing site for the desalination plant and upgrading infrastructure. Due to the differences between an oil refinery and a desalination plant, it is assumed that none of the existing facilities would be reused other than the roads. The pipelines, utilities, and electrical services that would accommodate the desalination plant do not match the facilities currently in use by the Phillips 66 Santa Maria Refinery. The current roads would be used for construction of the new desalination plant as well as be re-used for access to and from the plant when it is fully opened.

New infrastructure would consist of pipelines, buildings, filtration systems, pumping stations, and waste treatment. Additional details regarding the infrastructure required for a desalination facility is included in the “Desalination Plant Components” section below. In addition, due to the increased need for electrical power, it is assumed that the construction phase would include the development of new transmission lines and other required infrastructure upgrades.

Restoration

Another key phase of the proposed project involves the ecological restoration of the remainder of the Phillips 66 property located outside of the current facility footprint. This includes approximately 1,645 acres located on the following APNs: 091-141-062, 092-391-034, 092-391-020, 092-391-021, 091-192-034, 092-401-005, 092-401-011, 092-401-013, 092-411-005, and 092-411-002.

Restoration efforts will be directed towards improving the environmental and ecological condition of the degraded dune habitat and the degraded Little Oso Flaco Creek. Restoration efforts can take a variety of years based on the ecosystem being restored, the goal of restoration,

and the funding and support for the restoration. For the project site, restoration would occur after the majority of the infrastructure was built and would continue for several years to account for ongoing monitoring and adaptive management measures.

2.3.2 Desalination Plant Components
The proposed desalination plant is recommended to be constructed on the 200 acres (of the 1,780-acre property) currently occupied by the Phillips 66 Santa Maria Refinery campus as to avoid occupying any undisturbed land or habitats. This section will provide an overview of the typical components of a seawater reverse osmosis (SWRO) desalination plant. Reverse osmosis (RO) is a widely employed water purification technology and is the leading process for desalination. Reverse osmosis uses applied pressure to induce water permeation through a semipermeable membrane while omitting salts. This process uses less energy than most thermal distillation technologies. This process also requires extensive pretreatment to prevent critical failure of the membrane during operation.

Desalination plants can vary significantly in size, based on desired output. For reference, the largest desalination plants in California are found in Carlsbad and Huntington Beach. Both facilities were designed to produce 50 million gallons per day (MGD) or 56,000 acre-feet per year (afy) of potable water. The Carlsbad beach desalination facility occupies a 4-acre parcel. The Huntington Beach plant spans 11 acres.

Due to the lack of project design details or guidelines, this report provides three options for possible desalination plant sizes, production amounts, and energy consumption values (refer to Table 1: Typical Desalination Plant Size) based off California water trends and residential energy consumption data. The actual size of the desalination plant will be decided by the stakeholders and based on local limiting factors such as available industrial zoning space, energy consumption, amount of water produced, and is that water enough to supply an appropriate amount of community members.

Table 1 Typical Desalination Plant Size

<table>
<thead>
<tr>
<th>Water Production Supply (Daily Average)</th>
<th>Community Household Supply (Daily Average)</th>
<th>Energy Consumption by Plant (Daily Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 million gallons</td>
<td>375,000 gallons</td>
<td>405 mwh (megawatt hours)</td>
</tr>
<tr>
<td>50 million gallons</td>
<td>625,000 gallons</td>
<td>675 mwh</td>
</tr>
<tr>
<td>80 million gallons</td>
<td>1,000,000 gallons</td>
<td>1,060 mwh</td>
</tr>
</tbody>
</table>

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The following paragraphs provide additional details regarding the typical components required for the construction and operation of a SWRO facility (refer to Figure 3: Example SWRO Facility Schematic).

**Intake System**

The first step in a desalination treatment plant is the intake of ocean water and delivery to the plant. The intake location and type can vary - onshore intake, offshore intake, deep-water intake, and sub-seafloor intake are all potential options. The use of beach wells would substantially increase the risk of seawater intrusion into the regional groundwater basin. The inflow structure is subject to regulation by the EPA due to potential impacts to aquatic wildlife. The proposed solutions to these potential impacts include withdrawing water at such a rate as to allow wildlife to escape the intake structure or locating the intake structure outside areas of high biological productivity.

For the purposes of this analysis, we are assuming that an offshore intake pipeline would be installed along with an onshore pumping station located at the plant facility. This would allow the plant operators to control the speed of the pumping and the quantity of water being pulled through the intake system. A gate valve can be built to control the flow and a screening system can be installed to remove larger particles. For example, at the Sydney Desalination Plan, a drum screen filters out particles that are 3 millimeters or more in diameter. The Sydney plant has their offshore structure 300 meters offshore with intakes resting on the ocean bed 25-30 meters below the surface. The intake rate is very low in order to not harm the nearby wildlife and they also built artificial reefs around the intakes.

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It is assumed that the construction of the pipeline would be completed through one of the three trenchless methods: horizontal directional drilling (HDD), micro-tunneling, or auger boring. HDD requires that a pilot hole be created and once complete it is enlarged to fit the pipeline by “pre-reaming” it. The pipeline is then attached to the reamer which is connected to the drill string. A drilling rig is then used to pull the attached reamer and pipeline to the other side. Installing a pipeline via the micro-tunneling method encompasses utilizing “a remotely controlled micro-tunnel boring machine combined with the pipe jacking technique.” The auger boring method creates a bore hole using a rotating cutting head. HDD and micro-tunneling can lead to hydro-fracturing while auger boring has limitations on accuracy and where it can be used.

Pretreatment Facilities
Pretreatment is the first stage of the desalination process. When seawater arrives at the plant, it goes through a pretreatment process to remove particulates, debris, microorganisms, suspended solids and silt from the source seawater prior to reverse osmosis separation. In actuality, however, pretreatment systems remove most but not all of the suspended solids contained in the seawater. The suspended solids, particulates and silt that remain after pretreatment accumulate on the surface of the RO membranes and cause loss of membrane productivity over time. In addition, because seawater naturally contains bacteria as well as dissolved organics, a biofilm of bacteria can form on the membrane surface.

Two types of pretreatment systems are typically used to protect the SWRO membranes from fouling: conventional granular media filtration and membrane filtration. Currently, conventional granular media filtration is the predominant pretreatment technology for large and medium size desalination plants. In this process, seawater is pumped into multimedia filter tanks, which typically include layers of anthracite and sand atop a bed of gravel (refer to Figure 4: Conventional Granular Media Filtration). The filtered material is then separated out and pumped back to the ocean.

Before seawater enters the reverse osmosis filters to remove the salt particles, it must go through a second stage of pretreatment called microfiltration to remove smaller (oftentimes microscopic)

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impurities. At this point, virtually all impurities other than dissolved salts and minerals have been removed from the water, but it still needs to go through one more step to remove the dissolved salts and minerals to be ready for drinking. Once filtered, the water moves into the next stage of desalination.

**Reverse Osmosis Treatment Facilities**

The RO treatment is the center of the desalination process. RO systems leverage a semi-permeable membrane to remove ions, molecules, and unwanted contaminants and particles (salt in the case of desalination) from water. Reverse osmosis works by pushing water – under intense pressure – though semi-permeable membranes to remove dissolved salts and other impurities (refer to Figure 5: Example Pressure Vessel). High pressure pumps carry the water through the membranes. Much of the energy expended by the high-pressure pump is not used. Thus, an energy recovery device can be installed to reduce the total energy demand by 30%.

These membranes act like microscopic strainers that allow only water molecules to pass through, leaving behind the salt, minerals and other impurities such as bacteria and viruses. At the Tampa Bay Seawater Desalination Facility, the membrane pore size is 0.001 microns or 1/100,000th the size of a single human hair. At the Sydney Desalination Plant, there are 8 membranes per pressure vessel with a total of 36,000 membranes installed in the system (Sydney Desalination Plant). The size of the RO facilities will vary greatly depending on the water production capacity of the facility. For example, the Carlsbad Desalination Plant RO building contains more than 2,000 pressure vessels housing more than 16,000 reverse osmosis membranes.

**Post Treatment Facilities**

After the RO process, water typically undergoes chemical conditioning in product water post treatment facilities. Lime and carbon dioxide are used for post-treatment stabilization. The water then goes through a process called chloramination where chloramine is added in the form of

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ammonia and sodium hypochlorite to disinfect the water to the standards of the local health services standards.

**Product Water Storage**
Once the desalination process is complete, the water moves to storage tanks before being pumped to local water purveyors and blended with the regional water supply.

**Chemical Storage and Handling Facilities**
A wide range of chemicals are used extensively in the desalination and water treatment business\(^9\). Substances used typically falling into one of two main groups. The first group, known as ‘online’ chemicals, includes coagulants, flocculants, chlorination and de-chlorination agents and biocides. The second group, often called ‘offline’ chemicals, includes a large number of somewhat stronger chemicals that can be used for a variety of purposes such as dissolving the fouling that attaches to filtration membranes during operation. Typically, various chemicals associated with the desalination process are stored on site. Some commonly stored chemicals include sodium hypochlorite, sodium hydroxide, sodium tripolyphosphate, sodium dodecylbenzene ammonia, lime, ferric sulfate, citric acid, and sulfuric acid. Chemicals must be stored in accordance with Federal, State, and local standards.

**Concentrate Management\(^10\)**
High levels of Total Dissolved Solids (TDS) concentrates (>65,000 mg/L) are produced by RO plants, which may also contain some toxic chemicals used during feedwater pretreatment and post-treatment. The concentrate from desalination (often referred to as brine) varies in composition and volume depending upon the nature of the source water. This makes Concentrate Management necessary to prevent significant environmental impact. Selection of management strategies depends on several factors: the concentrate volume and quality, the location of the desalination plant, and the pertinent environmental regulations. The following paragraphs explore examples of concentrate management practices often used, along with the benefits and drawbacks of each, then give recommendations based on the site specifics. The most used options are surface water discharge, submerged disposal, sewer disposal, deep well injection, land application, evaporation pools, and zero liquid discharge (Handley\(^11\)).

**Surface Water Discharge.** This method involves disposing the concentrate in waterways adjacent to the plant including tidal rivers and streams, oceans, estuaries, or bays. Environmental concerns include long-term effects on the water quality of coastal aquifers and adverse impacts on the receiving waters’ ecosystems.

**Submerged Disposal.** In this method the concentrate is transported away from the desalination plant via underwater pipes to an estuarine and/or ocean location. Environmental concerns include

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potential impact of sinking briny concentrate on benthic marine organisms living on the sea bottom.

**Deep Well Injection.** Deep well injections greatly depend on the geological setting. For example, a porous layer and aquifer would be required near the site. Additionally, construction of deep injection wells can be costly. Depths vary among areas on how deep the well would need to go. An EPA permit is required to verify the well would be stable for injection. Lastly, groundwater quality could be impacted due to injection.

**Sewer Disposal.** Sewer disposal is a relatively inexpensive and straightforward disposal option. The liquid waste would be sent to a treatment plant used by the area. Options with this include concentrate discharge to the front or the back of the wastewater treatment plant. Discharge to the front is not recommended as conventional wastewater treatments do not remove TDS, which can result in significant impact on the biological treatment process of the wastewater. Discharge disposal to the end of the wastewater treatment plant mixes with the treated wastewater, resulting in a diluted concentrate. Drawbacks to this option include the cost of constructing an additional pipeline (and possibly a pump) connecting the two separate plants, as well as the possibility of adversely impacting receiving water despite the dilution. This may be a viable option for concentration disposal, as the Santa Maria Wastewater Facility is nearby, directly 12.5 driving miles southwest of the proposed project site. Additional research into the impact of this process on receiving water is recommended. Correspondence with the wastewater treatment plant would also be needed to be assessed if the plant has the ability to integrate with the desalination plant.

**Evaporation Ponds** are another option, constructed with liners and allow water evaporation while the salts accumulate at the bottom of the pond. These ponds are cost effective and demand low energy input, but are best suited for arid regions, as moist air will decrease evaporation rates. The main problems with evaporation ponds is the large area needed to hold the substantial volumes of liquid. The ponds must be at a shallow depth to allow for evaporation, causing small volumes to be held even when using large areas. In recent years, technology has been developed to decrease the land area needed for ponds, which may be explored for the project site. Monitoring is essential for this process due to the exposure to wildlife. There is also a risk of groundwater contamination due to pool leakage.

**Land Application.** This method involves application of the concentrate to salt-tolerant crops or vegetation. Feasibility of this method depends on the local climate, land availability, location of the groundwater table, and vegetation tolerance to salinity.

**Brine Concentrators.** Technologies such as brine concentrators are relatively new but promise large scale minimization in brine discharge volumes by extending the range of RO filtering membranes to that of thermal evaporation. This process uses heat exchangers, deaerators, and vapor compressors to convert the traditional liquid concentrate produced to a more slurry, concentrated form. With this technology, brines can be concentrated up to 130,000 mg/L, which minimizes the total amount of brine being sent out for disposal. Downsides to this method including locating a disposal site for high concentrates of salts, ions, and chemicals and increased energy requirements to accomplish this methodology.
**Zero liquid discharge.** The zero liquid discharge method is another fairly new technology that employs an evaporation process to turn brine into a dry solid. This process would not be best suited for this project because it is extremely energy intensive, expensive, and pairs the best with thermal desalination technologies, not reverse osmosis.

The environmental constraints analysis section below will focus on the submerged disposal option for concentrate management. Reasons for this include:

- It is one of the most common methods in practice at other existing desalination plants
- Under the Desalination Amendment to the California Water Resources Control Board, if the toxicity levels in concentrated discharge are below recently established thresholds, submerged disposal would be considered acceptable with mitigation applied.

**Distribution**

The project will be designed to deliver freshwater for domestic consumption, landscaping, agricultural uses, and potentially ecological restoration of impaired local freshwater streams. The extent and location of distribution pipelines is unknown at this time and will not be included as part of the environmental constraints analysis.

**2.3.3 Ecological Restoration Components**

The ecosystems of the project site include coastal dunes, freshwater lakes, wetlands, and marshes. The ecosystems have similar threats from intensive recreation and invasive species. Restoration efforts will be directed towards improving the environmental and ecological condition of the degraded dune habitat and the degraded Little Oso Flaco Creek. The primary components of the ecological restoration phase are outlined in the paragraphs below.

**Dune Habitat Restoration**

Dune restoration typically begins with the removal of over-stabilizing invasive vegetation. In many cases, that action alone is sufficient to return the system to the point where native species can recolonize, and communities can recover. In other cases, more intensive intervention is needed. Often in these cases, fencing will accompany the planting of native species. Sand fences help promote effective dune formation. All dune restoration efforts will measure success with regular monitoring and maintenance.

**Little Oso Flaco Creek Restoration**

The USDA Guidance for Stream Restoration lists nine steps for a successful a restoration effort:
1. Identify problems and opportunities;
2. Determine overall goals and specific objectives;
3. Inventory resources;
4. Analyze resource data;
5. Formulate alternatives;
6. Evaluate alternatives;
7. Make decisions;
8. Implement the plan;
9. Evaluate the plan;

There are numerous strategies for effective stream restoration. Different methods are useful for remedying different issues. In the case of Little Oso Flaco Creek, a study from the Coastal San Luis Resource Conservation District recommended biofiltration methods appropriate for farming activities and soil types. These methods include:

**Filter Strips.** A filter strip is an area of grass or other permanent vegetation used to reduce sediment, organics, nutrients, pesticides, and other contaminants from runoff and to maintain or improve water quality.

**Vegetated Waterways.** A vegetated waterway is a constructed channel that is shaped or graded to the required dimensions and established in suitable vegetation for the stable conveyance of runoff. It conveys runoff without causing erosion or flooding and improves water quality.

**Vegetated Retention Ponds and Basins.** Vegetated retention ponds and basins are meant to collect stormwater and slowly release it at a controlled rate so that downstream areas are not flooded or eroded.

3 Stakeholder Analysis

Before the potential stakeholders are introduced, a discussion regarding the importance of stakeholder involvement in a project such as desalination, as well as the methodologies for ensuring public involvement, needs to be addressed. Bright, Nielhuson, & Welsh Consulting recommends that a robust public outreach program is developed from the start to promote understanding and support for desalination, elicit stakeholder input, and ensure equitable accessibility to project information. This is to assure transparency and help build trust between the community and project developers.

A variety of methods were used to determine the potential stakeholders and gauge their level of interest in the proposed project. Under consideration were stakeholders who would be directly impacted during the development of the project, those who would experience post factum effects, and any involvement with public commons, such as oceanic and terrestrial recreation areas, wildlife, and air. Table 2 below outlines the stakeholders, their assumed area of interest, and any potential concerns within the project's constraints.
Table 2. Internal, External, and Key Stakeholder Analysis

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Area(s) of Interest</th>
<th>Potential Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local Groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Central Coast Economic Recovery Initiative</strong></td>
<td>Project clientele: concerned with promoting the long-term vitality of the Central Coast and, as it pertains to this project, infrastructure development</td>
<td>Economic viability of the proposed project and ensuring the central coast can economically recover from the closure of the Phillips 66 Santa Maria Refinery</td>
</tr>
<tr>
<td><strong>Oceano Economic Development Council</strong></td>
<td>Assessing avenues for Oceano’s equitable economic growth</td>
<td>Ensuring the conservation and preservation of local landscapes and ecosystems. Also receiving project approval from the San Luis Obispo Board of Supervisors</td>
</tr>
<tr>
<td><strong>Farm Owners of San Luis Obispo County</strong></td>
<td>Ensuring adequate and affordable water resources for irrigation</td>
<td>Balancing crop value with the affordability of desalinated water</td>
</tr>
<tr>
<td><strong>Residents of San Luis Obispo County</strong></td>
<td>Water quality, water prices, and the possible economic impacts of transitioning the project site from a refinery to a desalination plant.</td>
<td>Whether or not the desalinated water will stay local, the project’s impacts to public health, and plant operational costs to the community</td>
</tr>
<tr>
<td><strong>Dunes Collaborative</strong></td>
<td>Conservation and restoration of the Guadalupe-Nipomo Dunes, including species recovery and recreation opportunities</td>
<td>Habitat degradation, indirect affects to Oso Flaco Lake and the Guadalupe-Nipomo Dunes National Wildlife Refuge, and aesthetics impacts to the area for visitors</td>
</tr>
<tr>
<td><strong>EcoSlo</strong></td>
<td>Protecting and preserving San Luis Obispo County’s natural spaces</td>
<td>Impacts to the aesthetics and water quality of San Luis Obispo County</td>
</tr>
<tr>
<td><strong>Oceano Beach Community Association</strong></td>
<td>Protecting the livability, accessibility, and beauty of the Oceano community</td>
<td>Any sort of development occurring near the Oceano community</td>
</tr>
<tr>
<td><strong>Sierra Club: Santa Lucia Chapter</strong></td>
<td>Conservation of the natural environmental through public policy decisions</td>
<td>Marine and wildlife habitat protection and protecting air and water quality</td>
</tr>
<tr>
<td><strong>Surfrider Foundation – San Luis Obispo</strong></td>
<td>Ensuring public beach accessibility and clean ocean waters</td>
<td>Impacts to water quality through project development and implementation</td>
</tr>
<tr>
<td><strong>Regional Agencies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Central Coast Regional Water Quality Control Board</strong></td>
<td>Developing and enforcing water quality objectives for the safety of the public and the environment</td>
<td>Impacts to surface and marine water quality and the exportation of desalinated water</td>
</tr>
<tr>
<td><strong>Northern Chumash Tribal Council</strong></td>
<td>Non-profit organization concerned with cultural resource</td>
<td>Improving the quality of archaeology performed during land development</td>
</tr>
<tr>
<td>State Agencies</td>
<td>County of San Luis Obispo</td>
<td>San Luis Obispo County Water Resources Division</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>California Coastal Commission (CCC)</td>
<td>Preservation and advocacy for Chumash peoples</td>
<td>Understanding and achieving sustainable water resources for San Luis Obispo County</td>
</tr>
<tr>
<td>California Department of Fish and Wildlife (CDFW)</td>
<td>Development within county limits that meets the objectives laid out in the County’s Plan</td>
<td>Permitting and data collection for historical and current hydrological conditions</td>
</tr>
<tr>
<td>California Department of Public Health (CDPH)</td>
<td>Permitting requirements and alignment with the County Developmental Plan</td>
<td></td>
</tr>
<tr>
<td>California Department of Transportation (Caltrans)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>California Department of Water Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>California State Lands Commission (CSLC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>California State Parks – Oceano Dunes SVRA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Water Resources Control Board (SWRCB)</td>
<td></td>
<td></td>
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<tr>
<td>Federal Agencies</td>
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<td></td>
</tr>
<tr>
<td>Environmental Protection Agency (EPA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Work Product - For Informational Purposes Only</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### State Agencies

**California Coastal Commission (CCC)**

- Preserving and managing the coast during development in California’s Coastal Zone
- Acquiring Coastal Development Permits (CDP) since the project site is in the Coastal Zone

**California Department of Fish and Wildlife (CDFW)**

- Protecting biological resources, such as fish, wildlife, and plants, for their ecological values and for public enjoyment
- Development with the presence of multiple sensitive species under the California Endangered Species Act and impacts to sensitive ecological areas

**California Department of Public Health (CDPH)**

- Ensuring affordable and safe drinking water for the public
- Obtaining a Domestic Water Supply Permit (if the water will be used for residential consumption)

**California Department of Transportation (Caltrans)**

- Partnering with the private sector to facilitate transportation, goods movement, and mitigate air quality issues during development
- Accessibility to project site and transportation affects to air quality during development

**California Department of Water Resources**

- Maintains water infrastructure facilities, flood and groundwater management, and implements California’s Water Plan
- Ensuring that implementing another Californian desalination plant aligns with California’s Water Plan

**California State Lands Commission (CSLC)**

- Approving public access rights and developmental rights on California’s publicly owned lands
- Since the intake and outtake pipelines would occur in the Pacific Ocean, a possible separate EIR document and leasing amendments would be required

**California State Parks – Oceano Dunes SVRA**

- Preserving natural habitat while promoting various types of public recreation
- Impediment of park operations during project development and possible affects to park lands after development

**State Water Resources Control Board (SWRCB)**

- Interested in all aspects of California’s water resources: from acquisition, purification, allocation, and sustainable and efficient usage
- Ensuring desalination plants meet all regulations and newly designated technological standards for intake and discharge of desalination facilities

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**Federal Agencies**

**Environmental Protection Agency (EPA)**

- Protecting human health and the environment by ensuring clean air, land and water via
- Santa Maria Refinery’s oil well abandonment, project site
<table>
<thead>
<tr>
<th>Agency</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Oceanic and Atmospheric Administration (NOAA)</td>
<td>Conserve and manage marine ecosystems and fisheries, which in turn ensures coastal community resilience</td>
</tr>
<tr>
<td>US Department of Fish and Wildlife (USDFW)</td>
<td>Protecting endangered species and enforcing federal wildlife laws and acts for the benefit of the environment and the American people</td>
</tr>
<tr>
<td>US Army Corps of Engineers</td>
<td>Delivering vital engineering services and requiring permits for any construction or development in the nation’s navigable waters</td>
</tr>
</tbody>
</table>

### 4 Environmental Constraints Analysis

#### 4.1 Methodology

To identify the general environmental constraints associated with the proposed Nipomo Mesa Desalination Plant project, a variety of methods were employed by the team at Bright, Nielhuson & Welsh Consulting. A wide array of peer reviewed literature, governmental and non-governmental organization’s data bases, and other available environmental impact reports were all utilized to form the assumptions made by our team. It should be noted that the purpose of this document is not to provide CEQA level analysis of any possible environmental impacts associated with the implementation of the proposed project. The environmental constraint analysis by Bright, Nielhuson & Welsh Consulting is not based on current technical studies of the area. Rather, external research performed by and for other sources and the CEQA Appendix G guidelines were employed to identify potentially significant impacts the project could have that may trigger the CEQA process. No definitive statements about the significance of impacts can be made at this time.

#### 4.2 Environmental Issue Area 1: Aesthetics

##### 4.2.1 Issue Area Description

**On-site**

The current state of aesthetics on the site of the projected desalination plant is of low quality due to industrial machinery being less aesthetically appealing. There is the existing Phillips 66 Santa Maria Refinery that is planned to be decommissioned and replaced with the desalination plant. The project site is already under industrial zoning and currently has fuel tanks and oil processing building and machinery. The site of the Phillips 66 refinery is considered ESHA habitat. The project site also disrupts a possible scenic vista of the Pacific Ocean. The site is surrounded by agricultural land and the Oceano Dunes State Vehicular Recreation Area (SVRA). Scenic Highway 1 also passes by just east of the site. The existing site is viewable from multiple vantages including portions of Scenic Highway 1, high elevation points within Oceano Dunes SVRA, and the surrounding area and communities. Along with the sight of the project, industrial...
buildings can be made of metallic materials, potentially increasing glare. Additionally, industrial sites have security lighting that are always on throughout the night. Figure 6 below depicts the current refinery’s visuals at night.

![Aerial Photo of Phillips 66 Santa Maria Refinery At Dusk](image)

**Off-Site**
The aesthetics of off-site storage of equipment is also to be deemed as low quality. These facilities are industrial and large for housing extra parts and machinery. There is also a vent pipe in the middle of the dunes at Oceano Dunes SVRA that is not aesthetically pleasing. Additionally, the refinery is viewable from numerous locations including Scenic Highway 1, inside Oceano Dunes SVRA, and Oso Flaco Boardwalk Trail, depicted in Figure 7 below.

![View of Phillips 66 Refinery from Inside Oceano Dunes SVRA](image)

Figure 7 View of Phillips 66 Refinery from Inside Oceano Dunes SVRA

Figure 8 on the following page highlights pertinent vista points where people can view the project site from elevated vantage areas. San Luis Obispo County has Municipal Code standards that apply to visual resources (23.04.210). These standards may apply to this project site because
of the view of the site from the shoreline, how close they are to scenic corridors, and due to the project site being adjacent to ESHA. The project site is viewable from multiple locations along the shoreline within Oceano Dunes SVRA. Additionally, the habitat within the project site and adjacent Oceano Dunes SVRA is considered ESHA.

Figure 8 Scenic Points and Vistas
4.2.2 Potential Environmental Constraints

A potentially impact to aesthetics would occur if the project caused one or more of the following:

1. Have a substantial adverse effect on a scenic vista?
2. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Substantially degrade the existing visual character or quality of the site and its surroundings?
4. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

**Impact 1:** The proposed Nipomo Mesa Desalination Plant project does have potential to have substantial adverse effects on scenic vistas.

The deconstruction of the Phillips 66 Santa Maria Refinery will create increased activity of construction equipment and machinery. Additionally, the same will take place during the construction of the Nipomo Mesa Desalination Plant Project. This includes large cranes to lift and carry big pieces of equipment along with trucks to carry these objects in or away. The existing pipeline leading from the refinery to the ocean through Oceano Dunes SVRA will also need to be dug up and hauled away. Two new pipelines will be installed: one for sea water intake and another for briny discharge back into the ocean. During the process of pipeline removal and installation, a large trench will be dug from the ocean floor off the coast to the project site at least 2.5 miles away. This will disrupt the short-term aesthetics within Oceano Dunes. More pipelines may be installed to transfer freshwater into the Little Oso Flaco Creek in order to restore Oso Flaco Lake. Additionally, a pipeline may be constructed to transfer freshwater to be distributed throughout the county. Lastly, industrial sites are not aesthetically pleasing to begin with. The Nipomo Mesa Desalination Plant will consist of buildings, holding takes, pipes, and more that will be viewable from Highway 1 and other scenic vistas.

**Impact 2:** The proposed Nipomo Mesa Desalination Plant project does have potential to substantially damage scenic resources, including, but not limited to, trees, rock outcropping, and historic buildings within a state scenic highway.

During the decommission of the Phillips 66 Santa Maria Refinery and construction of the Nipomo Mesa Desalination Plant, vegetation may be damaged and/or destroyed. The project site and surrounding Oceano Dunes SVRA consists of ESHA, which is protected by the state of California.

**Impact 3:** The proposed Nipomo Mesa Desalination Plant project does have potential to substantially degrade the existing visual character or quality of the site and its surroundings.
Impact 3: *The proposed Nipomo Mesa Desalination Plant project does not have potential to substantially degrade the existing visual character or quality of the site and its surroundings.*

Since the proposed project site is currently under industrial zoning and is proposed to stay so with the construction of the Nipomo Mesa Desalination Plant, there will be no new impact to the existing visual character or quality of the site and its surroundings.

AES 4: Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Impact 4: *The proposed Nipomo Mesa Desalination Plant project does have potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.*

There is a potential for glare to persist with the project site remaining industrial and building materials being metallic. Additionally, industrial project sites produce a lot of light, specifically at night with security lighting. The prominent lighting creates a potential impact to the long-term aesthetics viewed from the surrounding communities and roadways.

4.2.3 Recommendations

AES 1: Would the project have a substantial adverse effect on a scenic vista?

To reduce the aesthetic impact on scenic vistas, Bright, Nielhuson, & Welsh Consulting recommends temporarily installing additional 12’ tall fencing wherever the proposed deconstruction of the Phillips 66 Santa Maria Refinery and construction of the Nipomo Mesa Desalination Plant can be viewed including the surrounding roadways and scenic vistas.

Additionally, in order to reduce aesthetic impacts during the decommissioning of the refinery’s pipeline that leads to the ocean and the construction of the seawater intake, briny output, Oso Flaco Lake recharge, and county distribution pipelines, Bright, Nielhuson, & Welsh Consulting recommends reducing the work hours to take place during the night. Temporary 12’ fencing should be installed following the length of the pipeline to block the view of deconstruction and construction of pipelines.

Lastly, in order to reduce the overall aesthetic impacts of the Nipomo Mesa Desalination Plant, Bright, Nielhuson, & Welsh Consulting recommends the planting of trees directly around the project site to reduce the visibility of the buildings. This works to restore the landscape surrounding the desalination plant foundation and encourage healthy scrublands that will help block the sight of the plant itself.

AES 2: Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
In order to reduce the aesthetic impact of the environmentally sensitive habitat area, Bright, Nielhuson, & Welsh Consulting recommends limiting the number of vehicles and machines. Additionally, contractors should plan to restore all damaged vegetation.

**AES 3: Would the project substantially degrade the existing visual character or quality of the site and its surroundings?**

Since there will be no new impacts to the existing visual character or quality of the site and its surroundings, Bright, Nielhuson, & Welsh Consulting has no recommendations to make.

**AES 4: Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?**

Bright, Nielhuson, & Welsh Consulting recommend a mitigation strategy of choosing painted or less metallic building materials for the Nipomo Mesa Desalination Plant to reduce the long-term aesthetic impacts of glare. Bright, Nielhuson, & Welsh Consulting also recommends reducing the hours of lighting to reflect the working hours of the Nipomo Mesa Desalination Plant. Additionally, our firm recommends reducing the number of lights and using red or yellow lighting, which is less impactful for wildlife and residents, creating less glare.

### 4.3 Environmental Issue Area 2: Air Quality

#### 4.3.1 Issue Area Description

San Luis Obispo County (SLO County) is within the South-Central Coast Air Basin, which also includes Santa Barbara and Ventura Counties. This region’s climate and air quality is strongly influenced by the speed and direction of the local wind patterns which are directed by a Pacific Ocean high-pressure system, topographical factors, and temperature differences. The coastal winds can quickly disperse pollutants inland negatively effecting air quality elsewhere. SLO County is approximately 3,316 square miles and can be separated into 3 distinct regions determined by their geography, biologic resources and meteorologic systems. The Coastal Plateau, the Upper Salinas River Valley, and the East County Plain contain loosely connected atmospheric sub-basins which allows meteorologists to divide them into more manageable areas of the county.

The proposed Nipomo Mesa Desalination Plant Project is located within the Coastal Plateau of the Coastal Zone, which produces most of the County’s pollution due to the high density of commercial and industrial facilities affecting the surrounding area’s air quality. The San Luis Obispo County Air Pollution Control District (SLOAPCD) monitors air pollutants with 7 permanent stations between the coast and the Carrizo Plain, most shown in Figure 9 with data collected on 4/26/21. The main pollutant concern near the coast is PM-10, course particles such as sea salt or fine soil particles, and PM-2.5, or Fine Particulate Matter, which is 2.5 micrometers in diameter or smaller. Many of these monitoring stations specialize in detecting these pollutants to determine the area’s approximate air quality without wasting resources testing for pollutants that are rarely detected.
Air Quality monitoring utilizes the established guidelines provided by the CEQA Appendix G, the Clean Air Act, and the National Ambient Air Quality Standards enforced by the SLOCAPCD and the California Air Resources Board. These entities evaluate the county based on the presence and concentrations of criteria pollutants including CO, NOx, SOx, PM-10, PM-2.5, and ozone. If any of these criteria pollutants are observed in concentrations greater than the predetermined thresholds for environmental impacts, there will need to be further mitigation efforts employed to reduce them below critical levels. SLO County is vulnerable to the influence of PM-10/25’s which are produced by the coastal dunes and ocean spray. The county is frequently classified as under non-attainment for these criteria pollutants, but certain portions of the county receive worse air quality than other areas.

One of the worst contributors to coastal air pollution in the Coastal Plateau sub-basin, the Oceano Dunes SVRA, is to the west of the project site and causes much of the Air quality impacts to this location and its surroundings suspending fine sand particles into the atmosphere on windy days. The SVRA’s 2 million annual visitors cause the nearby Mesa Air Station, in Figure 9 it is the only yellow marker, to record 60+ instances of exceeded state standards as well as 3+ exceeded federal standards, in 2013. On these relatively common poor air quality days, the concentrations of PM-10 can range from 200-600 ug/m^3 which exceeds the EPA’s standard of 150 ug/m^3 qualifying them to be classified as reaching non-attainment.
A secondary contributor to regional air quality is the Phillips 66 Santa Maria Refinery which is being deconstructed and repurposed for the Nipomo Mesa Desalination Plant. Since 1987, the Phillips 66 plant has emitted 7,850,364 lbs. of criteria pollutants as shown in Figure 10. The main contributors include Hydrogen Sulfide, Carbonyl Sulfide, Toluene, and Ethylene which are considered under the criteria pollutants SOx, CO, and ozone which are commonly found suspended in the atmosphere, but some can even integrate into nearby water sources or soils. In an attempt to mitigate against these harmful emissions, BACT burners were installed on enough of the heaters to reduce the emissions to a level below SLOCAPCD thresholds. These mitigation measures were implemented to increase efficiency of the Refinery stationary combustion devices and off-site programs to reduce ROG+NOx and GHG emissions.

<table>
<thead>
<tr>
<th>TOTAL AMOUNT OF POLLUTANTS RELEASED</th>
<th>7,850,364 Pounds</th>
</tr>
</thead>
</table>

*Pollutants Overview for Phillips 66 Co Santa Maria Refinery*

![Phillips 66 Santa Maria Refinery Emissions Bar Graph](image)

**Figure 10** Phillips 66 Santa Maria Refinery Emissions Bar Graph

### 4.3.2 Potential Environmental Constraints

A potential impacts to air quality would occur if the project caused one or more of the following:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).
4. Expose sensitive receptors to substantial pollutant concentrations; and/or
5. Create objectionable odors affecting a substantial number of people.
AIR 1 – Would the project conflict with or obstruct implementation of the applicable air quality plan?

Impact 1 - The proposed desalination plant is not predicted to conflict with the implementation of the San Luis Obispo County Air Quality Plan.

There are no predictable actions which will significantly alter or conflict with the implementation of the San Luis Obispo County Air Quality Plan. There may be increases in certain criteria pollutants which are common to the area such as PM 10 / 2.5, but these increases would not culminate into a significant impact. The regulatory agencies would be notified on the days that we have identified as high risk for construction of the project, and we will follow their guidance and expertise on how to minimize the impacts to air quality on those days.

AIR 2 – Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Impact 2 - The Proposed desalination plant is predicted to not contribute significantly to the existing air quality violations in this sensitive area.

The construction of the project’s subsites would have variable impacts on the air quality within the Coastal Plateau sub-basin. The construction process requires certain actions which would potentially create cumulative impacts or impacts at the beginning of construction, but no long-lasting impacts have been identified with the maintenance and operation of the Desalination Plant. The construction of Sub-site A on the repurposed foundation of the Philips 66 Refinery would have a less than significant impact on air quality considering that most or all work would be completed on paved surfaces which would not expose the surrounding area to additional PM-10/2.5 pollutants which is the main concern for this area due to its proximity to the SVRA.

The construction of the input and output pipelines would also require the installation of thousands of cubic feet of concrete housings to provide a firm foundation in the constantly shifting soils. It is known that the setting of concrete releases large quantities of greenhouse gases (GHG’s) which would negatively impact the surrounding ecosystem functions and create a passive introduction of harmful pollutants. In order to determine if the introduction of large amounts of poured concrete would cause significant amounts of criteria pollutants, further research would need to be done to estimate the impacts of installing a foundation for several miles of pipelines. This estimation would be impacted by the chosen placement of the pipelines and their total length which would influence the quantity of concrete that would be used.

AIR 3 – Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?
**Impact 3** - *It is predicted that there would be a temporary increase in criteria pollutants PM 10 / 2.5 and NOX during the construction of the project which may cause a cumulative impact to the air basin and surrounding area which is frequently achieving non-attainment for PM 10 / 2.5.*

The construction and installation of the transportation pipelines through the coastal dunes would undoubtedly cause a greater impact to air quality than the main base of operation for the desalination plant since the extent of the construction has not previously been developed and it covers a much larger area, increasing the risk of pollution. Much of the equipment would have to travel off paved roads in order to construct the necessary pipeline which also increases the likelihood that air quality would be affected since the undeveloped dunes would be frequently disturbed by the construction crews during and after construction. Based on prior desalination plans it was recommended that these pipelines be submerged up to 10 ft into the soil which could increase the density of PM-10/2.5 in the coastal air potentially causing a non-attainment of this criteria pollutant violating the air quality regulations for this area. Even though, comparatively the construction of the pipelines would cause significantly more problems for air quality than the construction of Sub-site A, on its own the construction would not be classified as under non-attainment. The air quality would only be degraded if it adds to the already poor air. There is also an expected increase in ozone, NOx, and carbon monoxide emissions during construction due to the operation and transportation of heavy machinery which may exceed the established thresholds during peak construction. The exhaust emissions of this equipment are variable depending on the fuel efficiency of the vehicles, the number of vehicles utilized, and the number of trips and distance these vehicles would have to travel to transport the materials necessary for the development of this project. It would be beneficial to do estimates of the emissions prior to construction in order to determine if the criteria pollutant would increase above mitigatable levels. The use of heavy machinery, based on similar projects, could temporarily increase NOx to a level of non-attainment; however, it is not a long-term factor involved in the operation of the desalination plant and would not produce permanent significant impacts on the air quality.

**AIR 4** – Would the project expose sensitive receptors to substantial pollutant concentrations?

**Impact 4** - *Due to the Hwy 101 and Santa Maria’s proximity to the desalination plant there are not any substantial impacts to sensitive receptors.*

There are sensitive receptors to the air affected by the desalination project including several schools, hospitals, and other at-risk organizations nearby but not within range of being affected by the construction of the desalination plant. These impacts are less than significant to pose any harm to the citizens of the down-wind city of Santa Maria or those who pass by briefly on Hwy 1 or 101. The citizens in this area are at a statistically greater risk of developing lung diseases such as asthma due to the influence of the current air quality conditions and it is expected that the construction of the desalination plant will not increase this rate of lung disease.

**AIR 5** – Would the project create objectionable odors affecting a substantial number of people
Impact 5 – Due to Hwy 101 and Santa Maria’s proximity to the proposed desalination plant, there will not be a substantial number of people affected by any objectionable odors produced.

There may be some less than significant objectionable fumes or odors created during the construction of the plant but during the long-term operation of the desalination plant there are no significant odors that will be produced. The duration and area of effect would have been determined to not impact a significant number of people.

4.3.3 Recommendations
Since no long-term impacts to the regional air quality were identified there are no recommendations for permanent mitigation measures. Bright, Nielhuson, & Welsh Consulting do recommend employing best management practices to limit the generation of fugitive dust and exhaust emissions of certain short-term activities. Our firm will defer to the expertise and guidance of the San Luis Obispo Air Quality Control District when determining best management practices.

4.4 Environmental Issue Area 3: Hydrology/Water Quality
4.4.1 Issue Area Description
This section addresses the existing water resource conditions of the areas in and around the proposed project site. For the purposes of this document, the hydrology and water resource environmental issue area will delve into the site’s existing water resources, water quality, site specific drainage patterns, and water quality and waste discharge requirements designated by the Central Coast Regional Water Quality Control Board (CCRWQCB). Groundwater and subsurface flows will not be adversely impacted by the proposed project, therefore the existing conditions for such will not be explicitly outlined in this document.

Site Description
The proposed Nipomo Mesa Desalination Plant Project is located in the southwestern portion of the Nipomo Mesa in the Santa Maria Valley. Topographically, the Nipomo Mesa is surrounded by the Pacific Ocean to the west, Edna Hills and Newson Ridge to the north, San Rafael Mountains to the east, and Casmalia and Solomon Hills to the south. Zooming into the project site, it is surrounded by the Oceano Dunes SVRA Sensitive Habitat Area to the west, agricultural fields to the south-southeast, and industrial and residential parcels east-north.

The proposed project is located directly on existing graded land from the refinery in parcel 092-401-01, which is an industrially zoned parcel and is contained in the California Coastal Zone and Flood Hazard Area\(^\text{13}\). The Coastal Zone, in significant coastal estuaries, habitat and recreation areas, extends inland to the first major ridgeline parallel to the sea or just 5 miles from mean high tide, whichever is less. As it pertains to this area, the Coastal Zone, which is regulated by the CCC, reaches 5 miles inland from the shore. As a designated Flood Hazard Area, this parcel has the possibility of being subjected to inundation by a 100-year

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flood, connecting from the Santa Maria River in large events. However, the flood risk is considered low.

Directly west to the project site is the Oceano State Beach, who’s marine environment is characterized by a shallow, out-sloping ocean floor. Marine maps of the area express relatively uniform underwater topography with no sea canyons in the vicinity. There are several marine water quality monitoring locations in the Oceano area, as well as Pismo, Avila, and Shell Beaches to the north. These stations regularly record particulate data for fecal coliform and E. coli levels to determine a water’s surf and swim eligibility. No other sources of water quality data, such as dissolved oxygen levels, salinity, pH, or temperature, are regularly measured for the area.

A Mediterranean climate persists in the area with cool, moist winters and warm, dry summers. Historically, annual precipitation ranges from 13-17 inches per year, with an average of 15 in. However, from most recent data collected in 2019 by the Nipomo Community Services District for the Nipomo Mesa Management Area, rainfall is exceeding the normal averages within the last few decades. Annual rainfall totals are ranging from 108% to 150% of average water year levels (water year is measured from October 1st to September 30th of the following year). Rainfall data was collected from rain gauges in 7 different locations in the Nipomo Mesa Management Area. With rainfall being the largest contribution to water supply for this area, increasing precipitation rates can mean a multitude of new considerations for landowners.

**Nearby Water Bodies of Interest**

Slope in the proposed projects area does not exceed 30%, however in surrounding parcels to the west, there are dune portions that do exceed a 30% slope. Elevations in the greater proposed project’s area range from sea level to about 150 ft above. The Nipomo Mesa’s undulating dune topography creates numerous depressions, leaving low lying areas with no outflow drainage. Because of this, there is a high incidence of localized ponding. Waterbodies of interest are the larger Oso Flaco Lake, Little Oso Flaco Lake, Oso Flaco Creek, Jack Lake, Lettuce Lake, and 6 other localized and minute dune ponds. Currently, there are no known diversions of surface waters in the Nipomo Mesa Management Area.

Northwest of the project site is Black Lake, an ecological area owned by San Luis Obispo County’s Land Conservancy. The lake is fed by Black Lake Canyon, an isolated stream that has not yet been assessed by the SWRCB under the EPA’s 303d listing. Surrounding Black Lake to

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the north are various other water bodies including Mud Lake, White Lake, Bolsa Chica Lake, Small Twin Lake, Big Twin Lake, Hospital Lake, Celery Lake, Pipeline Lake, and Willow Lake. These lakes are fed by a subsection of Arroyo Grande Creek and are tightly condensed, small scale lakes that separate dune lands from agricultural fields. Figure 11 depicts these lakes in relation to the project area, along with the more closely examined Oso Flaco Lakes and Creek.
The watershed of interest includes the Oso Flaco Creek Watershed, which is within the Nipomo Mesa Area of the Santa Maria River watershed. The Oso Flaco Creek Watershed is mainly self-reliant, with no water courses entering from the outside. The landscape of this watershed is characterized by low slopes, highly erosive sandy soils, and high levels of contaminants and legacy pesticides, like DDT\(^{18}\). The area spans 10,370 acres and consists primarily of agricultural land. Oso Flaco Creek serves as the drainage channel for agricultural runoff, receiving irrigation tail-water from ditches than run along Oso Flaco Road, straight into the creek. Flows travel westward along the creek into Little Oso Flaco Lake. Little Oso Flaco Lake overflows into another creek section named Little Oso Flaco Creek and then finally collects in Oso Flaco Lake. Jack Lake and Lettuce Lake (not shown in Figure 11) are two significantly smaller water bodies near the Ocean Dunes SVRA Sensitive Habitat Area boundary. They are not much larger than the localized dune pools but happen to be the only two of that smaller size with designated names.

**Existing Water Quality Conditions**

Oso Flaco Lake is a contained water body, except for a small, 2-inch-deep stream that empties into the Pacific Ocean. According to the Central Coast Ambient Monitoring Program (CCAMP), this watershed is one of the most seriously polluted on the Central Coast, in terms of nitrate concentrations, due to intense agricultural activity. All three of the above water bodies are listed under the EPA’s 303(d) list of Impaired Waters, designated by the Central Coast Department of Water Resources. Contaminant levels are measured and tracked periodically by the CCAMP. Pollutants that can be found in excessive amounts are unionized ammonia, chloride, fecal coliform, nitrate, orthophosphates, chlorpyrifos, diazinon, and legacy pesticides such as DDT and dieldrin. With the contaminant findings of the CCAMP, the water bodies’ beneficial uses have been summarized in Table 3 below\(^{19}\).

### Table 3 Water Quality Conditions of Oso Flaco Creek Watershed

<table>
<thead>
<tr>
<th>Monitoring Site</th>
<th>Unsafe to swim?</th>
<th>Unsafe to drink?</th>
<th>Impairs Aquatic Life?</th>
<th>Unsafe to eat fish?</th>
<th>Are agricultural uses impaired?</th>
<th>Are non-contact recreation activities impaired?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little Oso Flaco Creek at railroad crossing</td>
<td>Yes</td>
<td>Yes</td>
<td>Some evidence</td>
<td>-</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Oso Flaco Creek at Oso Flaco Lake Road</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>-</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Oso Flaco Lake at culvert</td>
<td>Yes</td>
<td>Yes</td>
<td>Some evidence</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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Water quality standards for the area are created by the EPA and imposed upon locally by the CCRWQCB. The boards Basin Plan is the master water quality control document for the area. It outlines all of the beneficial uses for water in this area, what needs to be done to protect those beneficial uses, and establishes data collection and adaptation strategies. Some categories that have standards which work to protect the beneficial uses of fresh, inland, surface waters are: color, taste/odor, suspended material, oil/grease, biostimulatory substances, turbidity, pH, dissolved oxygen, pesticides, inorganic/organic compounds, bacteria, and much more. Areas of concern for ocean water quality, in which there are standards in place, are: pH, temperature, and radioactivity. The CCRWQCB also imposes wastewater discharge requirements and permits. Discharges are managed so that they meet these requirements, meet water quality objectives, and protect the beneficial use of the water in which discharge is expelled into.

At 82 acres, Oso Flaco Lake is the largest freshwater body in proximity to the proposed project site and the largest of all lakes in the Nipomo Mesa Management Area. Both Oso Flaco Lake and Little Oso Flaco Lake are governed by the California State Parks and Recreation Department - Oceano Dunes District, within the Coastal San Luis Resource Conservation District (CSLRC). Upper areas of the watershed, including Oso Flaco Creek, are under the boundaries of the Cachuma RCD. Both lakes sit at capacity water levels year-round due to Oso Flaco Creek’s perennial nature, a steady influx of agricultural runoff, and the lack of high discharge rates leaving the lakes. Oso Flaco Creek’s discharge rate, based off 2009-2011 data, is 8.74 cfs. Figure 12 depicts Oso Flaco Creek at the juncture of Oso Flaco Lake Road on a particularly rainy day in 2006, with high amounts of suspended sediment in the water.

Figure 12 Site Photograph of Oso Flaco Creek

In 2018, the Coastal San Luis Resource Conservation District (CSLRC) began the Remediation of Pesticides in Oso Flaco Watershed project, funded by the SWRCB. The purpose of this project is to remove sediment from 1.2 miles of Oso Flaco Creek where high concentrations of DDT still exist. The goal is to prevent this contaminated sediment from ever entering Oso Flaco Lake.
Lake and install pesticide associated sediment control best management practices (BMP’s), including a sediment basin, vegetated ditch, and culvert to reduce erosion. The project is currently in progress, scheduled for the term 2020-2023.22

Drainage patterns of the proposed project site are heavily influenced by the prevalence of impervious surfaces. The existing facility has a small Municipal Separate Storm Sewer System (MS4s), as required by the county’s Stormwater Management Program, which treats stormwater that comes into contact with the facilities surfaces and empties into the Pacific Ocean. Precipitation from areas surrounding the project parcel drain into the Oso Flaco Creek watershed.

4.4.2 Potential Environmental Constraints
Consistent with CEQA Appendix G Guidelines, potentially significant impacts to hydrology and water quality could occur if the project would23:

1. Violate any water quality standards.
2. Discharge into surface waters or otherwise alter surface water quality (i.e., turbidity, sediment, temperature, dissolved oxygen, pH, etc.);
3. Substantially alter the existing drainage patterns of the site area (i.e., through the addition of impervious surfaces) which would:
   a. Result in substantial erosion or siltation on- or off-site.
   b. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
   c. Create or contribute runoff water which would exceed the existing or planned stormwater drainage systems, or provide additional sources of polluted runoff;
   d. Impede or redirect flood flows;
4. Involve activities within the 100-year flood zone.

Each of the project’s potential impacts are introduced along the corresponding CEQA Appendix G threshold. Following is a discussion regarding the impact’s potential significance pertaining to the project.

| HYD 1 – Would the project violate any water quality standards? |

**Impact 1** – *The project has the potential to violate water quality standards through the construction and operational processes. However, the project is not expected to violate these standards providing pertinent surface and marine water quality regulations are addressed and followed accordingly.*

Water quality standards for SLO County are outlined in the Regional Water Quality Control Boards Basin Plan and Ocean Plan. In reference to the construction of the desalination plant,
additional facilities, pipelines, and utilities are necessary. The project is subject to obtain a General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2009-0009-DWQ) through the State Water Resources Control Board, pursuant of the Nation Pollution Discharge Elimination System (NPDES) under the Clean Water Act\textsuperscript{1}. This permit requires the creation of a Storm Water Pollution Prevention Plan (SWPPP), which applies to the project as construction would disturb 1 or more acres of soil through means of clearing, grading, stockpiling, and excavation. The intent of this plan is to protect surface and groundwater from degradation due to the construction process. Short term water quality impacts from construction have the potential to be significant if the construction site’s loose soils and liquid and solid contaminants are not properly managed.

During the operational lifetime of the plant, the project is not expected to violate any water quality standards. The proposed project would be subject to ocean water quality guidelines set by the State Water Board, further discussed in Threshold-2. However, because there are no specifically delegated regulations regarding desalination plant discharge, effects on marine water quality will have to be individually researched and analyzed for this project site. Also, the purpose for the desalinated and treated water that will be leaving the facility is unknown at this point in time. Therefore, potential water quality impacts for the treated freshwater cannot be determined.

<table>
<thead>
<tr>
<th>HYD 2 – Would the project discharge into surface waters or otherwise alter water quality?</th>
</tr>
</thead>
</table>

**Impact 2 – The project is expected to discharge into surface waters and alter the water quality surrounding the discharge site. Since the ocean is delegated as a surface water, this project has the potential to significantly impact marine water quality in the long-term operations of the desalination plant as briny discharge is expelled into the Pacific Ocean.**

Briny discharge from the desalination process is to be expelled back into the ocean via an outtake pipeline as a Submerged Disposal Concentrate Management Practice. This discharge can be up to twice as salty, contain other chemical contaminants, and be of a different temperature than the existing ocean water. This can have potentially significant environmental impacts on water quality, regarding pH, temperature, salinity, and dissolved oxygen (D.O.) levels- not to mention the implications of this on marine and benthic organisms as well.

Currently, the California Ocean Plan does not specify requirements regarding waste management of brine discharges to coastal waters. Each plant is considered in a case-by-case basis in determining the thresholds for concentrates allowed in discharged fluids. However, the Ocean Plan does set the following guidelines:

- Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded
- Waste management systems that discharge into the ocean must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community
- Waste discharge to the ocean must be essentially free of substances which will accumulate to toxic levels in marine waters, sediments, or biota
Table 4 below outlines the regulations assigned to various desalination plants around the world. Salinity standards outside of the United States range from 1 ppt (part per thousand), or 5%, up to 40 ppt.

Table 4 Regulations and Salinity Limits for Briney Discharge

<table>
<thead>
<tr>
<th>Region/Authority</th>
<th>Salinity Limit</th>
<th>Compliance Point (relative to discharge)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>US EPA</td>
<td>Increment ≤ 4 ppt</td>
<td>1,000 ft</td>
<td>San Diego Regional Water Quality Control Board 2006</td>
</tr>
<tr>
<td>Carlsbad, CA</td>
<td>Absolute ≤ 40 ppt</td>
<td>1,000 ft</td>
<td>Santa Ana Regional Water Quality Control Board 2012</td>
</tr>
<tr>
<td>Huntington Beach, CA</td>
<td>Absolute ≤ 40 ppt salinity (expressed as discharge dilution ratio of 7.5:1)</td>
<td>1,000 ft</td>
<td></td>
</tr>
<tr>
<td>Western Australia guidelines</td>
<td>Increment ≤ 5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oakajee Port, Western Australia</td>
<td>Increment ≤ 1 ppt</td>
<td></td>
<td>The Waters of Victoria State Environment Protection Policy</td>
</tr>
<tr>
<td>Perth, Australia/Western Australia EPA</td>
<td>Increment ≤ 1.2 ppt at 50 m and ≤ 0.8 ppt at 1,000 m</td>
<td>50 m and 1,000 m</td>
<td>Wec, 2002</td>
</tr>
<tr>
<td>Sydney, Australia</td>
<td>Increment ≤ 1 ppt</td>
<td>50-75 m</td>
<td>ANZECC (2000);</td>
</tr>
<tr>
<td>Gold Coast, Australia</td>
<td>Increment ≤ 2 ppt</td>
<td>120 m</td>
<td>GCD Alliance (2006).</td>
</tr>
<tr>
<td>Okinawa, Japan</td>
<td>Increment ≤ 1 ppt</td>
<td>Mixing zone boundary</td>
<td>Okinawa Bureau for Enterprises</td>
</tr>
<tr>
<td>Abu Dhabi</td>
<td>Increment ≤ 5%</td>
<td>Mixing zone boundary</td>
<td>Kastner (2008).</td>
</tr>
<tr>
<td>Oman</td>
<td>Increment ≤ 2 ppt</td>
<td>300 m</td>
<td>Sultanate of Oman (2005)</td>
</tr>
</tbody>
</table>

Discharge into other bodies of water, besides the Pacific Ocean, is not expected from this project. Regarding restoration efforts for Oso Flaco Lake and Oso Flaco Creek, water quality is only expected to increase with restoration projects and is not expected to be adversely impacted from facility runoff.

**HYD 3** – Would the proposed project substantially alter the existing drainage patterns of the site area?

**Impact 3** – _The project is not expected to substantially alter the existing drainage patterns of the site area. The proposed project involves constructing the desalination plant over existing graded areas from the Santa Maria Refinery. While additional construction efforts, such as excavation, may be necessary, the site is not expected to be largely transformed from what already exists in terms of additional impervious surfaces and runoff patterns._

The proposed desalination plant is planned to cover less acreage than that of the existing refinery so necessary steps will need to be taken to transform the impacted refinery soils back to natural landscape. Consideration of soil type, slope and aspect will be needed in order to prevent substantial erosion or siltation on/off-site due to runoff. The project is not expected to substantially increase the rate of surface runoff in a manner that would result in flooding. Total impacts to drainage patterns have the potential to be less than significant with appropriate avoidance and minimization efforts taken.

**HYD 4** – Would the proposed project involve activities within a 100-year flood zone?

**Impact 4** – _The construction of underground intake and outtake pipelines and the restoration portion of the proposed project is expected to involve activities within a 100-year flood zone. The_
The proposed project site for construction of the desalination plant is within Zone X, according to FEMA Flood Maps. Zone X refers to an area of minimal flooding hazard, outside of 500-year flood zones. The facility itself would not be in a 100-year flood zone as it is important that critical facilities, such as a water desalination treatment plant, be in at least a 500-year floodplain or higher elevation.

In-take and out-take pipelines, as well as the restoration of Oso Flaco Creek and Lake, have the potential to be in areas of high flood risk (within a 100-year flood zone). Installation of the pipelines have the potential to go through high flood risk areas as well as coastal tidal areas. The possibility of the desalination facility’s pipeline components losing structural integrity due to a flood has the potential to have significant environmental impacts.

Restoration activities will be occurring within a 100-year flood zone; however, these efforts are with the intention to better regulate and direct flooding and filter runoff. Estimated impacts in this area are expected to be environmentally beneficial, with steps taken during restoration project construction to ensure materials are properly managed and disposed of.

4.4.3 Recommendations

Provided are Bright, Neilhuson & Welsh Consulting’s recommended avoidance and minimization measures to prevent potentially significant impacts to the project sites water quality and hydrologic resources.

**HYD 1 – Would the project violate any water quality standards?**

Potentially significant impacts to water quality during construction could be avoided with Best Management Practices (BMP’s) that will be a part of the SWPPP. This includes, but is not limited to spill prevention, waste management, and cleaning and maintenance measures.

Bright, Neilhuson & Welsh Consulting also recommends that third party analyses are conducted to determine the existing marine water quality conditions near the proposed intake and outtake pipelines. There are currently no existing, in-depth water quality studies performed for the Oceano State Beach area and this project would greatly benefit from the completion of such. From there, discharge load limitations could be determined in conjunction with the State Water Boards Ocean Plan as to avoid significant environmental impacts from briny discharge.

**HYD 2 – Would the project discharge into surface waters or otherwise alter water quality?**

Recommended avoidance and minimization strategies for ensuring minimal environmental impacts on marine water quality are left to the RWQCB. The Board decides what constitutes the “best available site, design, technology, and mitigation measures feasible”. It is recommended

that a mixing zone is designated near the out-fall pipeline to allow for the diffusion and mixing of brine with seawater, whether than be through natural ocean turbulence, a multi-port brine diffuser, or a combination of both. Assessment of the tidal and ocean floor characteristics near the chosen out-fall site will need to happen in order to determine if a multi-port brine diffuser will be necessary. If so, port spacing and orientation of pipe discharge to tidal currents will also need to be determined.

It is recommended that a Marine Life Mitigation Plan (MLMP) be developed to satisfy the projects needs for long-term, permanent, stand-alone operations with an emphasis on minimizing the impacts to marine water quality and benthic organisms. A final MLMP should be refined, and a specific mitigation site identified prior to the CCRWQCB’s decision on the approval or disapproval of the NPDES permit.

**HYD 3 – Would the proposed project substantially alter the existing drainage patterns of the site area?**

To minimize the chance of substantially altering existing drainage patterns of the site, consideration of the existing refinery’s stormwater system and runoff patterns should be evaluated to determine whether they can be transferred into the desalination facilities design. Site remediation of impacted soils during construction will be necessary to prevent the chance of increased erosion and siltation due to storm water runoff.

**HYD 4 – Would the proposed project involve activities within a 100-year flood zone?**

Regarding intake and outtake pipeline construction in the 100-year flood zone and coastal tidal areas, the US Army Corps of Engineers (USACE) is expected to be heavily involved in the construction process to ensure structure integrity of the pipelines. Factors such as depth, soil type, and subsurface hydrology will all need to be examined to determine proper placement of the pipelines. Special considerations for pipeline placement are necessary due locations influence from tidal activity, ODSVRA off-roading recreation, and the flood hazard area.

### 4.5 Environmental Issue Area 4: Energy

#### 4.5.1 Issue Area Description

The Appendix G Issue Area of Utilities will focus on Energy for the scope and purpose of this assessment. Regarding power sourcing and generation, the existing conditions will focus primarily on electricity, as the equipment associated with operation of the desalination plant utilizes electric power. The existing conditions for sources of energy to Phillips 66 Santa Maria Refinery, as well as regional energy sources and providers, building efficiency codes, and various legislation will be discussed in this section.

The existing Phillips 66 Santa Maria Refinery (SMF) is powered with a mix of sources, detailed in the projects FEIR⁴. SMF uses fuel gas produced from the refining operation as a fuel source primarily to fire heaters and boilers for process heat and stem. Surplus gas is purchased from Southern California Gas Company when the refinery cannot produce necessary levels of steam.
and electricity. The electrical requirements at SMF are met by on-site generation as well as purchases from Pacific Gas & Electric (PG&E). Table 5 & 6 summarize SMF’s utility usage and sources of energy from 2005-2009\textsuperscript{25}.

\footnote{Phillip’s 66 Refinery EIR/Project Description?}
### Table 5  Santa Maria Facility Utility Usage

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pacific Gas and Energy (MWhr)</td>
<td>23,587</td>
<td>23,316</td>
<td>19,293</td>
<td>22,736</td>
<td>23,273</td>
</tr>
<tr>
<td>Onsite Generation (MWhr)</td>
<td>-</td>
<td>-</td>
<td>29,333</td>
<td>24,041</td>
<td>20,732</td>
</tr>
<tr>
<td><strong>Natural Gas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern California Gas (mmcf)</td>
<td>220</td>
<td>372</td>
<td>214</td>
<td>226</td>
<td>397</td>
</tr>
<tr>
<td>Onsite Fuel Gas (mmcf)</td>
<td>-</td>
<td>-</td>
<td>2,747</td>
<td>2,550</td>
<td>2,185</td>
</tr>
<tr>
<td>Flaring of coker and non-coker gas (mmcf)</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>0.79</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Diesel Fuel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Gallons)</td>
<td>-</td>
<td>-</td>
<td>8,911</td>
<td>5,449</td>
<td>4,591</td>
</tr>
</tbody>
</table>

Notes: MWhr = mega watt hours, mmcf = million standard cubic feet
Source: Phillips 66

### Table 6  PG&E 2019 Power Mix

<table>
<thead>
<tr>
<th>ENERGY RESOURCES</th>
<th>PG&amp;E 2019 POWER MIX</th>
<th>2019 CA POWER MIX (For Comparison)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base Plan</td>
<td>100% Solar Choice</td>
</tr>
<tr>
<td>Eligible Renewable¹</td>
<td>29%</td>
<td>100%</td>
</tr>
<tr>
<td>• Biomass and waste</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>• Geothermal</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>• Small hydroelectric</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>• Solar</td>
<td>12%</td>
<td>100%</td>
</tr>
<tr>
<td>• Wind</td>
<td>9%</td>
<td>0%</td>
</tr>
<tr>
<td>Coal</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Large Hydroelectric</td>
<td>27%</td>
<td>0%</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>44%</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Unspecified²</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Percentage of Retail Sales Covered by Retired Unbundled RECs³: 0%
The equipment associated with operation of the desalination plant utilizes electric power, power which can be sourced from PG&E, similarly to the existing Phillips 66 Refinery. Existing transmission lines to the project site are illustrated in Figure 13. In 2019, 29% of the power mix of PG&E-owned generation and power purchases was electricity sourced from renewable resources that qualify under California’s Renewables Portfolio Standard. Of these renewable sources 29% was from various renewables, 27% from large hydroelectric, and 44% from nuclear. These various renewables include biomass and waste, geothermal, small hydroelectric, solar, and wind. PG&E states that they are well-positioned to meet the new 60% by 2030 Renewable Portfolio mandate that was set forth by SB 100. Table 6 illustrates PG&E’s 2019 power mix compared with California’s 2019 power mix, distinguishing the differing sources between PG&E’s base plan, 100% solar choice, and 50% solar choice.

In addition to electricity provided by PG&E, the City of San Luis Obispo and Morro Bay joined Central Coast Community Energy (previously named Monterey Bay Community Power) in January of 2020, Arroyo Grande and other communities joined in January of 2021. Central Coast Community Energy (3CE) has a renewable energy mix higher than PG&E’s and is a community choice energy program. Additionally, 3CE has committed to reaching 60% clean and renewable energy by 2025 and 100% clean and renewable energy by 2030, which is 15 years ahead of California’s SB 100 goals of 100% zero-carbon energy by 2045 as well as ahead of PG&E’s commitments. Currently agriculture, business, and residential customers are served by 3CE, with no information provided regarding the potential of powering industrial facilities in the future. However, the expansion of 3CE in the future is likely and would be easily integrated into an industrial facility through the current energy grid if this becomes an option.

As nuclear is the largest source of renewable energy from PG&E as well as the closest power station to the project site, the shutdown of Diablo Canyon must be noted. The Diablo Canyon Nuclear Power Plant is slated to shut down in 2025, both units will be shut down and PG&E will remove everything from the area. This shutdown may impact the amount of renewable energy provided by PG&E, especially in the shorter-term, but also poses an opportunity for expansion of renewable energy possibly utilizing the site. Assembly Bill 525 is a proposed bill that would require the California Public Utilities Commission to identify a specific target of 3 gigawatts by 2030 for offshore wind development. Leaders in San Luis Obispo County see the Diablo Canyon site for green energy.

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29 SLO County leaders eyeing Diablo Canyon site for green energy | Pacific Coast Business Times. (2021, March 6). [https://www.pacbiztimes.com/2021/03/05/slo-county-leaders-eyeing-diablo-canyon-site-for-green-energy/](https://www.pacbiztimes.com/2021/03/05/slo-county-leaders-eyeing-diablo-canyon-site-for-green-energy/)
Canyon site as promising for green energy, especially if the proposed bill is passed. There is an existing grid tie-in and space in Morro Bay for potentially the largest battery storage facility in North America, and leaders believe using this site and the transmission presented by Diablo Canyon will prevent additional fossil fuels from the grid.

![Transmission Line & Project Site](image)

**Figure 13** Phillips 66 Plant and PG&E Transmission Lines

Building efficiency standards at the state level are created by the California Energy Commission (CEC) and updated every three years, including standards through the Energy Code to “reduce
wasteful, uneconomic, inefficient, or unnecessary consumption of energy”\textsuperscript{30}. The Energy Code is a set of design and construction requirements that apply once a decision to begin a construction project has been made and a building permit has been requested. The 2019 Energy Code\textsuperscript{31} is currently in place, but the pre-rulemaking for the 2022 building efficiency standards is currently underway and to be adopted in 2021 with an effective date of January 1, 2023. There is a list of proposed amendments in the 2022 Energy Code, two of which are areas of potentially significant environmental impact and applicable to the proposed desalination project.

The first encourages heat pump technology, which reduces on-site gas combustion for space and water heating requirement. This equipment relies on refrigerants which have potentially high global warming potential, as leakage of refrigerants can result in greenhouse gas emissions. However, utilization of heat pump technology is more efficient than combustion equipment, along with reducing GHG emissions caused by combustion. California is mandated to continue working to decarbonize the electricity system by converting to renewable sources, so the CEC states that it is reasonable to expect that the relative advantages of heat pump technology will increase over time. The second proposed change to the Energy Code would entail incorporating battery storage systems into nonresidential system requirements. These battery storage systems are typically lithium-ion batteries, which are a regulated hazardous material. These potential changes to the Energy Code that may result in significant environment impacts will likely be integrated into the existing standards soon.

The 2019 Building Efficiency Standards are currently in place, and the proposed changes to the Code will build off these current standards. Section 10-115 of the 2019 Code is titled \textit{Community Shared Solar Electric Generation System or Shared Battery Storage System Compliance Option for On-Site Solar Electric Generation or Battery Storage Requirements}. Community shared solar or battery storage system may be utilized as a compliance option if approved by the Commission to partially or entirely meet the on-site solar electric generation system and/or battery storage system that is required by Section 150.1(b)1 of Title 24, California Code of Regulations, Part 6. Community shared systems can replace the on-site requirement if there are energy savings benefits to the building in the form of: actual reductions in energy consumption of the dedicated building; utility energy reduction credits that will result in building’s energy consumption that is subject to energy bill payments; OR payments to the building that will have equivalent effect as energy bill reductions. Reductions from these requirements must be greater than the added cost to the building that results from the building’s share in community shared solar or battery system.

\textbf{4.5.2 Potential Environmental Constraints}


Impact 1 – The project has the potential to generate wasteful, inefficient, and unnecessary consumption of energy resources. This may result both in the construction phase through inefficient planning of construction activities and use of construction equipment and in the operational phase due to the high energy consumption of desalination plants, specifically from unused energy expended from reverse osmosis technology.

It is assumed that none of the existing facilities will be reused besides the roads. The construction phase will include new infrastructure including pipelines, buildings, filtration systems, pumping stations, and waste treatment. There is potential of inefficient and unnecessary energy consumption in the short-term if materials are sourced from further away than necessary and with unnecessary or inefficient transportation of materials and workers. Additionally, inefficient construction management and planning may cause the project to take longer to complete than necessary, resulting in unnecessary consumption of energy.

Impacts to efficiency in the long-term may occur with the selection of plant size. The three choices of desalination plant sizes and daily average energy consumption of each are as follows: 30 million gallons a day (MGD) & 405 megawatt hours (Mwh); 50 MGD & 675 Mwh; or 80 MGD & 1,060 Mwh. Selection of a plant size that has too small of a capacity for the demand of the region may necessitate expansion of the plant in the future, resulting in the inefficient and unnecessary use of energy and resources in construction for the expansion. Alternatively, selecting a plant with a capacity that is too high compared to the demand would result in unnecessary and wasteful energy use during operation. Similarly, to the selection of the plant size, the technology selected for the plant will also have an impact on the efficiency of the consumption of energy resources. New technology is constantly being created that increases efficiency, and the selection of this technology during construction has the potential to decrease or increase the efficiency of the plant during operation.

Desalination plants have greater electrical energy requirements than the existing oil refinery, and thus demand the construction of additional power lines in the construction phase. The construction of new industrial voltage compatible transmission lines has the potential to trigger CEQA Appendix G, due a high level of energy necessary to construct the lines. Additionally, this construction would likely require the temporary shutdown of some electrical grids in the Nipomo City area, impacting and straining local utilities. Residents would need to be notified of this potential shutdown prior to construction.

Impacts to efficiency in the long-term may occur with the selection of plant size. The three choices of desalination plant sizes and daily average energy consumption of each are as follows: 30 million gallons a day (MGD) & 405 megawatt hours (mwh); 50 MGD & 675 mwh; or 80 MGD & 1,060 mwh. Selection of a plant size that has too small of a capacity for the demand of the region may necessitate expansion of the plant in the future, resulting in the inefficient and unnecessary use of energy and resources in construction for the expansion. Alternatively, selecting a plant with a capacity that is too high compared to the demand would result in unnecessary and wasteful energy use during operation. Similarly, to the selection of the plant size, the technology selected for the plant will also have an impact on the efficiency of the consumption of energy resources. New technology is constantly being created that increases efficiency, and the selection of this technology during construction has the potential to decrease or increase the efficiency of the plant during operation.
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Desalination plants have greater electrical energy requirements than the existing oil refinery, and thus demand the construction of additional power lines in the construction phase. The construction of new industrial voltage compatible transmission lines has the potential to trigger CEQA Appendix G, due a high level of energy necessary to construct the lines. Additionally, this construction would likely require the temporary shutdown of some electrical grids in the Nipomo City area, impacting and straining local utilities. Local residents would need to be notified of this potential shutdown prior to construction.

Along with the greater electrical needs of a desalination plant, reverse osmosis treatment facilities without avoidance measures waste significant levels of energy. In the desalination process, high pressure pumps carry the water through membranes, and much of the energy expended by the pump is not used, posing a potential conflict to ERG 1 with the wasteful and inefficient use of energy.

**ERG 2 – Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?**

**Impact 2 – The project has the potential to obstruct state or local energy efficiency plans due to the high electricity requirement of desalination plants in the operational phase of the project. This impact is determinant on the energy source selected to power the plant as well as the determination of installing on-site solar.**

Title 24 of the California Code of Regulations requires an on-site solar electric generation system and/or battery storage system to be incorporated on newly constructed sites, and the Energy Code states that this compliance can be met through utilization of community shared solar or battery storage systems. Potential obstruction of state plans for renewable energy may occur if the site does not incorporate on-site solar or connect to a community shared solar system.

Energy demands from the operation of the facility will vary depending on the size of the facility that is constructed, the three alternatives are discussed in the Project Description and above in the constraints pertaining to ERG 1. The source of energy resources has the potential to obstruct the state and local plans for renewable energy and efficiency standards, or to significantly decrease the greenhouse gas emissions of the plant. As discussed in the previous ‘Existing Conditions’ section, it is assumed that the electrical energy will be purchased from PG&E. PG&E has committed to the state mandate of reaching a power mix that is 60% renewable by 2030, so sourcing electricity from PG&E should not obstruct state or local plans for renewable energy. Energy demands from the operation of the facility will vary depending on the size of the facility that is constructed, and three alternatives will be assessed for the purpose of this analysis. The source of energy resources has the potential to obstruct the state and local plans for renewable energy and efficiency standards, or to significantly decrease the greenhouse gas emissions of the plant. The three choices of desalination plant sizes and daily average energy consumption of
each are as follows: 30 million gallons a day (MGD) & 405 megawatt hours (mwh); 50 MGD & 675 mwh; or 80 MGD & 1,060 mwh. As discussed in the previous ‘Existing Conditions’ section, it is assumed that the electrical energy will be purchased from PG&E. PG&E has committed to the state mandate of reaching a power mix that is 60% renewable by 2030, so sourcing electricity from PG&E should not obstruct state or local plans for renewable energy.

4.5.3 Recommendations

**ERG 1** – Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

To avoid the potential inefficient or unnecessary energy consumption during construction, it is recommended that materials are sourced from the nearest supplier of the material where applicable and financially feasible, in order to reduce the distance of transporting materials. Additionally, it is recommended that carpooling or bussing programs are developed to transport workers to the site, reducing vehicular traffic and avoiding unnecessary energy usage and carbon emissions. The use of electric vehicles and buses for construction and transportation to the site should be considered and utilized where feasible, further reducing fossil fuel energy consumption. It is also recommended to prioritize the timeline and construction management plan, to ensure that the project is completed as efficiently as possible, avoiding unnecessary consumption of energy.

Avoidance measures are necessary in the selection of the plant size to prevent the unnecessary or inefficient consumption of energy during construction and/or operation. The demand for water provided by the desalination plant should be studied thoroughly to determine the appropriate size and capacity of the desalination plant. An alternative recommendation, as seen in other desalination plants across California is constructing a plant with a higher capacity but operating only a portion of the plant until demand grows. This would limit energy expended to expand the plant later on as well as prevent wasteful use of energy producing too much desalinated water in the shorter-term. Bright, Nielhuson & Welsh recommend thorough surveys and studies to quantify the demand for desalination water of the surrounding community and restoration aspect of this project.

An avoidance measure to reduce the high levels of unused energy that results in the desalination process, an energy recovery device (ERD) should be installed. This technology can reduce the total energy demand by 30% and up to 60% in some cases with new technology, such as the Rotary-driven ERD and the Piston-driven ERD32. Rotary-driven ERDs are typically the viable option due to the durability and compact size. Rotary-driven ERDs can have pressurization repurposing effectiveness from 95-97%. The implementation of ERDs in the redeveloped site is highly recommended to reduce the long-term impacts of high energy demand for the RO facility.

To comply with Title 24 of the California Code of Regulations, Bright, Nielhuson & Welsh recommend construction of an on-site solar electric generation system and/or battery storage system. There are multiple options for the implementation of on-site solar and further investigation into the best option based on the site specifics and energy requirement of the plant is recommended. The first recommendation is implementing solar PV on the roofs of the facility where applicable, as seen in the Marin Desalination Project and sourcing the remaining energy required from PG&E. The second, alternative recommendation is implementing a larger scale solar farm on the site where land is not being used, potentially in the adjacent grazing land, unused industrial land, and/or through the utilization of solar parking structures. Further research regarding the impacts of implementing a solar farm on this land is recommended, as this may potentially impact other environmental issue areas as well as conflict with the restoration aspect of this project. This second option would produce significantly more energy for the plant, increasing the renewable energy intake and resulting in lower utilities costs overtime, but would also pose potential environmental impacts. A third recommendation would be a combination of recommendation one and two, implementing solar PV on roofs where applicable and building a solar farm on a plot adjacent to the desalination plant. To comply with California mandates for the installation of on-site solar on new buildings, Bright, Nielhuson, & Welsh Consulting recommend implementing one of the avoidance measures discussed above. The firm also recommends further studies into the environmental impact of implementing a solar farm on land adjacent to the plant, as well as economic analysis to determine the most cost-effective strategy long-term.

5 Environmental Processes and Permits

5.1 California Environmental Quality Act

Conversion of the Phillip 66 Santa Maria Refinery site into a desalination plant will require extensive permitting at the local, state, and federal levels. This section will focus on the state level permitting required in California for the project and highlight the key steps of the California Environmental Quality Act (CEQA) necessary for this approval of the project, identify stakeholders, agencies, and their jurisdiction level.

This project will trigger a CEQA analysis for approval. The most relevant for permitting approval under CEQA is the Environmental Impact Report (EIR). The EIRs purpose is to understand the possible environmental impacts of the project, determine if the impact would be significant, and then lay out a plan for mitigation or alterations needed for project approval under CEQA.

Within the EIR, the Appendix G section will determine the thresholds of significance for the possible environmental impacts of the project. The CEQA process from start to finish will involve many agencies and stakeholders. Including: United States Army Corp of Engineers (USACOE), California Coastal Commission (CCC), California State Water Resource Control Board (CSWRCB), the Central Coast Regional Water Quality Control Board (CCRWQCB), the United States Environmental Protection Agency (USEPA), California Environmental Protection Agency (CalEPA), and the California Fish and Game Department.
United States Fish and Wildlife (USFWS), private landowners, and public land managed by California State Land Commission. Not all agencies will have a significant or direct role in the CEQA permitting process of this project.

The hierarchy of agencies within the CEQA process is broken into specific categories. The Lead Agency is the public agency that has the primary responsibility for carrying out or approving a project. The Responsible Agency, which is another public agency with some discretionary authority over a project or a portion of it. The Trustee Agency, which is a state agency having jurisdiction by law over natural resources that are held in trust for the people of California, and which may be affected by a project.

In this project, the lead agency is likely to be the CCC, since the entirety of the project takes place in Coastal Commission regulated land. This is also the permitting agency that will trigger CEQA. Responsible agencies will include: CSWRCB, RWRCB, USFWS, California State Land Commission. Figures 14 and 15 below outline a simplified diagram of the CEQA process.

![CEQA Process Flowchart](image)

Figure 14  CEQA Process Flowchart
Specific Permitting Breakdown:

United States Army Corps of Engineers (USACOE):

- Section 10 (Navigable Waterways)
  o The USACE regulates discharges of dredged or fill material into navigable Waters of the United States under Section 404 of the Clean Water Act (CWA). The project may result in unavoidable fill of some jurisdictional wetlands or Waters of the U.S. during the construction of the intake and output pipelines. This impact will prompt the following permitting actions. There would be no possible exception under section 404 (Clean Water Act) because of the extent of the dredging and replacing of natural materials for the installation of intake pipeline for the project.
  - 404 Permit Required:
    o Regional General Permit: The project will have temporary adverse effects therefor Bright, Nielhuson, & Welsh Consulting recommend that a Regional General permit would be obtained.
    o State Programmatic General permit: Permit that is designed to pass of responsibility to state level if appropriate protections are in place. This will likely pass USACE jurisdiction to the California Coastal Commission.

California Coastal Commission (CCC):

- Coastal Development Permit Application:
  o Approval of a land use permit constitutes approval of a Coastal Development Permit in compliance with the San Luis Obispo County Local Coastal Program and California Coastal Act
  o Project permit request will trigger CEQA. All affected resources determined by the CEQA required EIR will now be involved in permitting process, and additional agency involvement now required.
  - SWRCB & RWQCB under authority of California Coastal Commission will issue permits if deemed appropriate by respective agencies.

Air Pollution Control District (APCD):

- Based on available knowledge at this time, the project is not expected to result in any adverse impacts to the air quality of the SLOC. Bright, Nielhuson, & Welsh Consulting does not anticipate the need for formal Air Pollution Control District Review. However, the APCD requires permitting for the Authority to Construct and Operate, based on Section 23.06.082, within this vulnerable area. If future studies based on the local Air Quality Monitoring data determine that the project had a significant impact on the Air Quality in that area, then formal or informal consultation may be required to resolve this issue. To avoid these potential issues the project manager must obtain the Authority to Construct permit, and the Permit to Operate from the Control Officer of the APCD in order to assure the project will not have any adverse effects on the Air Quality.
5.2 Anticipated Permits and Authorizations

5.2.1 Local Land Use Permitting Analysis

The following section summarizes the permitting and development requirements anticipated for the project, based on the SLO County Coastal Zone Land Use Ordinance (Title 23), the SLO County Coastal Allowable Use Table and Definitions, and the South County Coastal Area Plan.

Coastal Allowable Use Table & Definitions

SLO County Coastal Allowable Use Table and Definitions defines each land use category – with their purpose and intended character. For purposes of this analysis, Agriculture – Prime Soils, Agriculture – Non-Prime Soils, Recreation, and Open Space will be discussed. Coastal Table O lists the uses of land than may be established in the land use categories and may be used to determine what uses are allowable. Bright, Nielhuson, & Welsh have condensed Table O to include only the land use categories and allowable uses that are pertinent to the project, as seen in Table 7.

The following are Use Statuses and Definitions to use as a key to interpret Coastal Table O:

- **A** – allowed use; unless otherwise limited by a specific planning area standard. Coastal Zone Land Use Ordinance Chapter 23.03 determines the permit necessary to establish an ‘A’ use, Chapters 23.04 through 23.06 determine the site design, site development, and operational standards that affect the use.
- **S** – Special use; allowable subject to special standards and/or processing requirements unless otherwise limited by a specific planning area standard. The list below shows where in the Coastal Zone Land Use Ordinance to find the special standards that apply to certain uses.
- **P** – Principally permitted use; a use to be encouraged and has priority over non-principally permitted uses, but not over agriculture or coastal dependent uses.
### Table 7 Coastal Table O With Pertinent Land Use Categories

<table>
<thead>
<tr>
<th>‘S’ NUMBER</th>
<th>APPLICABLE COASTAL ZONE LAND USE ORDIANCE SECTION AND/OR LAND USE ELEMENT REQUIREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23.08.120 b MISCELLANEOUS USES</td>
</tr>
<tr>
<td>2</td>
<td>23.08.120 a MISCELLANEOUS USES</td>
</tr>
<tr>
<td>3</td>
<td>23.08.040 AGRICULTURAL USES</td>
</tr>
<tr>
<td>4</td>
<td>23.08.060 CULTURAL, EDUCATION &amp; RECREATIONAL USES</td>
</tr>
<tr>
<td>5</td>
<td>23.08.080 INDUSTRIAL USES – are allowable subject to the special standards found in Section 23.08.080</td>
</tr>
<tr>
<td>14</td>
<td>Uses are allowable in the Open Space land use category on privately-owned land subject to Coastal Zone Land Use Ordinance Section 23.08.120a in addition to the special standards in Chapter 23.08, only when authorized by a recorded open space agreement executed between the property owner and the county.</td>
</tr>
<tr>
<td>15</td>
<td>Listed processing activities are allowable in the Rural Lands and Agriculture land use categories only when they use materials extracted on-site pursuant to Coastal Zone Land Use</td>
</tr>
<tr>
<td>20</td>
<td>23.08.300 ELECTRIC GENERATING PLANTS</td>
</tr>
</tbody>
</table>

The following Table 8 is based on the Key to Coastal Table O, but only includes the land use categories pertinent to the project. The project site is zoned mainly as Industrial and Open Space but is surrounded by areas zoned as Agriculture and Recreation that may be affected by some aspects of this project.

### Table 8 Key to Coastal O Table With Allowable Land Usages

<table>
<thead>
<tr>
<th>Allowable Uses/Page # of Use</th>
<th>Agriculture - Prime Soils</th>
<th>Agriculture - Non-Prime Soils</th>
<th>Recreation</th>
<th>Industrial</th>
<th>Open Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Generating Plants/6-44</td>
<td>S-20</td>
<td>S-20</td>
<td>S-20</td>
<td>S-20-P</td>
<td></td>
</tr>
<tr>
<td>Pipelines &amp; Transmission Lines</td>
<td>S-13</td>
<td>S-13</td>
<td>S-13</td>
<td>S-13</td>
<td>S-14</td>
</tr>
<tr>
<td>Public Utility Facilities</td>
<td>S-13</td>
<td>S-13</td>
<td></td>
<td></td>
<td>S-13</td>
</tr>
</tbody>
</table>

Definitions of allowable uses are also listed in the document, and the uses pertinent to this project are defined in the following paragraph.

_Electric Generating Plants_ include facilities engaged in the generation and distribution of electrical energy for sale, including energy generated from ‘alternative’ sources including water, wind, the sun, biogas, municipal or agricultural wastes. This allowable use may apply to the project, as it is possible that excess energy from the on-site solar will be sold back into the grid – although energy produced may only be used by the desalination plant.
Pipelines and Transmission Lines include pump stations, bulk stations, surge and storage tanks, transmission lines for a public utility company, and more – which will be implemented in the project.

Public Utility Facilities may be applicable to the project as this use includes treatment plants and storage, settling ponds and disposal fields – and facilities that are used immediately in the production, generation, storage, or transmission of water, wastewater, or electrical power. This use area should be noted, although it may not ultimately be pertinent for the project.

Specific Permits

National Pollutant Discharge Elimination System (NPDES) Permit:
The project possibly requires a NPDES individual permit, instead of a general permit, because of the desalination facilities nature to be an individual discharger into marine waters. Individual permits are written to reflect site specific conditions of a single discharger when the applicable requirements may not be fully known before obtaining coverage. Filling for an individual permit entails submitting an application form to the permitting authority at least 180 days before the expected commencement of discharge. Even earlier than that is recommended as the permit may take longer than 6 months to obtain. The Clean Water Act specifies that NPDES permits may not be issued for a term longer than 5 years, so reapplication is required every 5 years- at least 180 days prior to permit expiration date. Jointly with the permit, a SWPPP will mostly likely need to be created.

California Water Code Section 13142.5(b). Determinations for New and Expanded Desalination Facilities: Site, Design, Technology, and Mitigation Measures Feasibility Considerations
The owner or project developer shall submit a request for a Water Code Section 13142.5(b) determination to the CCRWQCB as early as practicable. This Water Code outlines the policies of the state with respect to water quality as it relates to the coastal marine environment. It is relevant due to the high possibility of the facility discharging briny waste via submerged disposal methods. The CCRWCB will consult with other state agencies involved with the permitting of the facility in making the final decision of approval. These agencies include, but are not limited to: California Coastal Commission, California State Lands Commission, California Department of Fish and Wildlife, California State Parks, and US Army Corps of Engineers.

Guidelines set out in Chapter III.M of the Ocean Plan detail the various considerations, analyses, and approvals required for planning a desalination project in California. The executive director of the State Water Board ultimately has authority over the facility’s general considerations, onshore facility and offshore pipeline locations, the design/layout/form/function of the facility (including intake capacity and type of infrastructure involved), technology used to construct and operate components, and mitigation replacing all forms of marine life or habitat lost due to the construction and operation of the plant. Under consideration is whether the need for desalinated water is consistent with pre-
existing urban water management plans. The South County Coastal Plan does not specify whether the addition of water treatment facilities is beyond the scope of the plan. However, there are points made to express the need for new, innovative, and environmentally sustainable strategies for freshwater procurement. All of South County’s freshwater is currently supplied by various private wells and the Nipomo-Mesa groundwater sub-unit, which is currently in overdraft condition. The addition of a desalination facility to the county does not seem to counteract any existing county plans.

**Incidental Take Permit - Section 10a(1)(B) of the ESA**

The Endangered Species Act prohibits the "take" of listed species through direct harm or habitat destruction. In the 1982 ESA amendments, Congress authorized the U.S Fish and Wildlife Service (through the Secretary of the Interior) to issue permits for the "incidental take" of endangered and threatened wildlife species. Thus, permit holders can proceed with an activity that is legal in all other respects, but that results in the "incidental" taking of a listed species.

**SLO County Coastal Zone Land Use Ordinances (Title 23)**

There are many county coastal ordinances that pertain to the development and operation of the Nipomo Mesa Desalination Plant. They will be summarized and mentioned below.

**23.04.220 - Energy Conservation, Including Design for Solar Orientation.**

- New development shall consider compact community design and incorporation of energy efficiency measures.

**23.05.090 - Shoreline Structures.**

- Seawalls, cliff retaining walls, revetments, breakwaters and groins and other shoreline protective devices are subject to the following requirements.
- **Where allowed:** Construction of shoreline structures that would substantially alter existing landforms shall be designed by a registered civil engineer or other qualified professional and shall be limited to projects necessary for:
  - Protection of existing coastal development, consisting only of the principal structure and not including accessory structures such as garages, decks, steps, eaves, landscaping, etc. No shoreline protection device shall be allowed for the sole purpose of protecting accessory structure(s); or
  - Protection of public beaches and recreation areas in danger of erosion.
  - Coastal dependent uses; or
  - Existing public roadway facilities to public beaches and recreation areas where no alternative routes are feasible.
- **Permit requirement.** Minor Use Permit, unless a Development Plan is otherwise required by Chapters 23.03 or 23.08 of this title or planning area standards of the Land Use Element for the proposed use of the site. Structures located below mean high tide line or within the Coastal Commission’s original permit authority may also require a permit from the California Coastal Commission.

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• **Required findings.** In order to approve a land use permit for a shoreline structure, the Planning Director or other applicable review body shall first find that the structure is designed and sited to:
  - Eliminate or mitigate adverse impacts on the local shoreline sand supply as determined by a registered civil engineer or other qualified professional; and
  - Not preclude public access to and along the coast where an accessway is consistent with the provisions of Section 23.04.420 (Coastal Access Required); and
  - Be visually compatible with adjacent structures and natural features to the maximum extent feasible; and
  - Minimize erosion impacts on adjacent properties that may be caused by the structure; and
  - Not adversely impact fish and wildlife; and
  - Those non-structural methods of protection (artificial sand nourishment or replacement) have been proven to be impractical or infeasible.

**23.05.140 - Archeological Resources Discovery.**

- In the event archeological resources are unearthed or discovered during any construction activities, the following standards apply:
  - Construction activities shall cease, and the Environmental Coordinator and Planning Department shall be notified so that the extent and location of discovered materials may be recorded by a qualified archeologist, and disposition of artifacts may be accomplished in accordance with state and federal law.
  - In the event archeological resources are found to include human remains, or in any other case when human remains are discovered during construction, the County Coroner is to be notified in addition to the Planning Department and Environmental Coordinator so that proper disposition may be accomplished.

**23.06.044 - Exterior Noise Level Standards.**

- The exterior noise level standards of this section are applicable when a land use affected by noise is one of the following noise-sensitive uses which are defined in the Land Use Element and Local Coastal Plan: residential uses listed in Table 7, Framework for Planning, except for residential accessory uses and temporary dwellings; health care services (hospitals and similar establishments only); hotels and motels; bed and breakfast facilities; schools (pre-school to secondary, college and university, specialized education and training); churches; libraries and museums; public assembly and entertainment; offices, and outdoor sports and recreation.
  - No person shall create any noise or allow the creation of any noise at any location within the unincorporated areas of the county on property owned, leased, occupied or otherwise controlled by such person which causes the exterior noise level when measured at any of the preceding noise-sensitive land uses situated in either the incorporated or unincorporated areas to exceed the noise level standards in the following Table 9. When the receiving noise-sensitive land use is outdoor sports and recreation, the following noise level standards shall be increased by 10dB.
Table 9  Exterior Noise Level Standards During the Daytime and Nighttime

<table>
<thead>
<tr>
<th>EXTERIOR NOISE LEVEL STANDARDS</th>
<th>Daytime (7:00 a.m. to 10:00 p.m.)</th>
<th>Nighttime¹ (10:00 p.m. to 7:00 a.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly Equivalent Sound Level (Lₐₑₐ, dB)</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>Maximum level, dB</td>
<td>70</td>
<td>65</td>
</tr>
</tbody>
</table>

- In the event the measured ambient noise level exceeds the applicable exterior noise level standard in subsection (a), the applicable standard shall be adjusted to equal the ambient noise level plus 1dB.
- Each of the exterior noise level standards specified in subsection (a) shall be reduced by 5dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.
- If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be measured, the noise level measured while the source is in operation shall be compared directly to the exterior noise level standards.

23.06.108 - Chemical Control.
- Land use permit applications that require discretionary review for projects that have potential to release toxic or hazardous materials (e.g., gas stations, businesses that handle hazardous wastes) shall include measures, and where applicable, Best Management Practices that: a) minimize the amounts of potential contaminants that may be stored or handled, b) assure proper containment and c) prevent release of contaminants into the environment. These measures and practices shall be referred to the County Division of Environmental Health for review and for recommendations that shall be implemented through the land use permit.

23.06.120 - Toxic and Hazardous Materials.
- The storage and use of poisonous, corrosive, explosive and other materials hazardous to life or property are subject to the following standards, where applicable. The standards of these sections are in addition to all applicable state and federal standards, including but not limited to any regulations administered by the County Health Department, Fire Department, Sheriff’s Office, Agricultural Commissioner, and Air Pollution Control District. In the event any standards of this chapter conflict with regulations administered by other federal, state, or county agencies, the most restrictive standards apply.

23.07.080 - Geologic Study Area (GSA).
- A Geologic Study Area combining designation is applied by the Official Maps (Part III) of the Land Use Element, to areas where geologic and soil conditions could present new developments and their users with potential hazards to life and property. These standards are applied where the following conditions exist:
  - Seismic hazard: Areas of seismic (earthquake) hazard are identified through the application of an Earthquake Fault Zone. Earthquake Fault Zones are established by the state geologist as required by Sections 2621 et seq. of the Public Resources
Code (the Alquist-Priolo Earthquake Fault Zones Act) and are identified in the Land Use Element (Part II).

- **Landslide hazard**: Areas within urban and village reserve lines, identified by the Seismic Safety Element as being subject to moderately high to high landslide risk, and rural areas subject to high landslide risk;
- **Liquefaction hazard**: Areas identified by the Seismic Safety Element as being subject to soil liquefaction.
- **Erosion and stability hazard - coastal bluffs**: Areas along the coast with coastal bluffs and cliffs greater than 10 feet in vertical relief that are identified in the Coastal Erosion Atlas, prepared by the California State Department of Navigation and Ocean Development (1977), in accordance with Hazards Policy No. 7 of the Local Coastal Plan.

### 23.07.170 - Environmentally Sensitive Habitats.

- **Application content**: A land use permit application for a project on a site located within or adjacent to an Environmentally Sensitive Habitat shall also include a report by a biologist approved by the Environmental Coordinator that:
  - Evaluates the impact the development may have on the habitat, and whether the development will be consistent with the biological continuance of the habitat. For those environmentally sensitive habitat areas which are only seasonally occupied, or where the presence of the species can best be determined during a certain season (e.g., an anadromous fish species or annual wildflower species), the field investigation(s) must be conducted during the appropriate time to maximize detection of the subject species. The report shall identify possible impacts, their significance, measures to avoid possible impacts, mitigation measures required to reduce impacts to less than significant levels when impacts cannot be avoided, measures for the restoration of damaged habitats and long-term protection of the habitats, and a program for monitoring and evaluating the effectiveness of such measures.

- **Required findings**: Approval of a land use permit for a project within or adjacent to an Environmentally Sensitive Habitat shall not occur unless the applicable review body first finds that:
  - There will be no significant negative impact on the identified sensitive habitat and the proposed use will be consistent with the biological continuance of the habitat.
  - The proposed use will not significantly disrupt the habitat.
- **Development standards for environmentally sensitive habitats**: All development and land divisions within or adjacent to an Environmentally Sensitive Habitat Area shall be designed and located in a manner which avoids any significant disruption or degradation of habitat values. This standard requires that any project which has the potential to cause significant adverse impacts to an ESHA be redesigned or relocated so as to avoid the impact or reduce the impact to a less than significant level where complete avoidance is not possible.
23.07.174 - Streams and Riparian Vegetation.
- Coastal streams and adjacent riparian areas are environmentally sensitive habitats. The provisions of this section are intended to preserve and protect the natural hydrological system and ecological functions of coastal streams.
  - Development adjacent to a coastal stream. Development adjacent to a coastal stream shall be sited and designed to protect the habitat and shall be compatible with the continuance of such habitat.

23.07.176 - Terrestrial Habitat Protection.
- The provisions of this section are intended to preserve and protect rare and endangered species of terrestrial plants and animals by preserving their habitats. Emphasis for protection is on the entire ecological community rather than only the identified plant or animal.
  - Protection of vegetation. Vegetation that is rare or endangered, or that serves as habitat for rare or endangered species shall be protected. Development shall be sited to minimize disruption of habitat.
  - Terrestrial habitat development standards:
    - Revegetation. Native plants shall be used where vegetation is removed.
    - Area of disturbance. The area to be disturbed by development shall be shown on a site plan. The area in which grading is to occur shall be defined on site by readily identifiable barriers that will protect the surrounding native habitat areas.
    - Trails. Any pedestrian or equestrian trails through the habitat shall be shown on the site plan and marked on the site. The biologist's evaluation shall also include a review of impacts on the habitat that may be associated with trails.

23.07.178 - Marine Habitats.
- The provisions of this section are intended to preserve and protect habitats for marine fish, mammals, and birds. Development within or adjacent to marine habitats is subject to the provisions of this section.
  - Protection of kelp beds, offshore rocks, reefs and intertidal areas. Development shall be sited and designed to mitigate impacts that may have adverse effects upon the habitat, or that would be incompatible with the continuance of such habitat areas.
  - Siting of shoreline structures. Shoreline structures, including piers, groins, breakwaters, seawalls, and pipelines shall be designed or sited to avoid and to minimize impacts on marine habitats.
  - Coastal access. Coastal access shall be monitored and regulated to minimize impacts on marine resources. If negative impacts are demonstrated, then the appropriate agency shall take steps to mitigate these impacts, including limitations of the use of the coastal access.

5.2.2 Regulatory Permitting Analysis
To proceed with the proposed project’s planning and development, there are multiple permits that must be obtained at the federal, state, and regional level. Many of these permits follow a
regulatory timeline and may require independent studies to be conducted on site. Proper planning must be taken to ensure that ample time if allotted for each permits review period, as some involve consecutive approval by multiple governmental agencies.

Table 10 below outlines the permits required to comply with pertinent environmental stipulations, mainly under the Clean Water Act and Endangered Species Act. The agencies involved are listed with the permit(s) under their approval, along with how each specifically pertains to the proposed project. Following the matrix is a further explanation of each required permit and the reason for such.

Table 10 Regulatory Permitting Matrix

<table>
<thead>
<tr>
<th>Agency</th>
<th>Permit</th>
<th>Regulation</th>
<th>Regulated Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Federal</strong></td>
<td></td>
</tr>
<tr>
<td>1. USACOE</td>
<td>a. Section 404 of CWA</td>
<td>a. Section 404 and 10 of Clean Water Act</td>
<td>a. Construction and operation of intake/output pipelines and restoration of Little Oso Flaco Lake</td>
</tr>
<tr>
<td>2. USFWS</td>
<td>a. Incidental Take Permit</td>
<td>a. Endangered Species Act</td>
<td>a. Construction and operation of intake/output pipelines and restoration of Little Oso Flaco Lake</td>
</tr>
<tr>
<td></td>
<td>b. 50 CFR-21 (Migratory Bird Permit)</td>
<td>b. Migratory Bird Treaty Act</td>
<td>b. Construction and operation of desalination plant, as well as any restoration projects</td>
</tr>
<tr>
<td>3. NOAA Fisheries</td>
<td>Incidental Take Permit</td>
<td>a. Endangered Species Act</td>
<td>Construction and operation of intake/output pipelines and restoration of Little Oso Flaco Lake</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>State of California</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. California Environmental Protection Agency (CalEPA)</td>
<td>a. NPDES Discharge into Ocean Waters Permit</td>
<td>a. Clean Water Act, Section 403</td>
<td>a. Discharge of briney wastewater from desalination facility</td>
</tr>
<tr>
<td>5. CCC</td>
<td>a. Approval of Section 404 of CWA</td>
<td>a. Clean Water Act</td>
<td>a. Reviews and approves or denies all 404 permits for activities affecting the coastal zone, ensuring accordance with the California Coastal Management Plan</td>
</tr>
<tr>
<td></td>
<td>b. Coastal Act</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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| **6. CDFW** | a. Section 2081 of CESA  
b. Lake and Streambed Alteration Agreement | a. California Endangered Species Act  
b. Fish and Game Code section 1602 | a. Regulates activity that has the potential to negatively affect state-protected plant or animal species or their habitats directly or indirectly including listed endangered or threatened species.  
b. Discharge of dredge or fill material from construction of the project and/or restoration of Little Oso Flaco Lake |

| **Regional** | a. NPDES Stormwater and Wastewater Permits  
b. 401 Water Quality Certification (WDR Permit) | a. Clean Water Act  
b. Clean Water Act and Porter-Cologne Water Quality Control Act | a. Regulates stormwater discharges from MS4’s, construction, and industrial activities; also regulates point source discharges into United States waters.  
b. Discharge of dredge or fill material from construction of project and/or restoration of Little Oso Flaco Lake into United States waters |

| **7. CCRWQCB** | | | |

**Federal**

*Section 1a.* Section 404 of CWA the constraints of this required permit will be dealing within the USACOE. The main issue for this permit is dealing with such a large agency. The USACOE receives a huge volume of permits and the likelihood of the agency responding is low. The benefit is that there is 6 months waiting period. After the permit request is submitted, if the USACOE does not respond the permit requirement is no longer necessary.

There are three types of 404 permits: Regional General Permit, Nationwide General Permit (NWP), and Individual General Permit (IP). An NWP authorizes activities that may cause only minimal individual and cumulative impacts for projects including road crossings, bank stabilization, repairs to existing structures, flood control maintenance, and wetland restoration for wildlife habitat – all of which are potential activities of this project. However, NWPs generally authorize only up to 0.5 acres of permanent impacts within USACOE jurisdiction, if the impact exceeds 0.5 acre, an IP is required, which may also be authorized at the regional level. Before the issuing of an IP, other approvals are required including NHPA Consultation under Section 106, Consistency with CZMA including a CCC Letter of Concurrence as the project is located in a Coastal Zone, receipt of a RWQCB 401 Water Quality Certification, and consultation under the federal Endangered Species Act (ESA). It is recommended that an IP be authorized at the regional level, as regional knowledge of the affected area is typically better than at the federal level, this specialized knowledge of the area can reduce the risk of potential environmental disasters or unintended or unforeseen degradation.
Section 1b. Navigable Waterways under the USACOE permit requirements. The intake/outlet pipeline will trigger USACOE permit requirements. The interference with navigable waterways will require NEPA significance impacts report. The same issues with the number of permits requested from USACOE applies to section 10, along with the same benefits of the 6-month waiting period.

Section 2a. An Incidental Take Permit from the United States Fish and Wildlife Service will be required because of the possibility of endangered or listed species or their habitats being harmed during the construction and installation of the intake/outlet pipelines and the restoration of Oso Flaco Lake. Federally listed endangered species in the area include: LaGriosa Thistle, Marsh Sandwort, Nipomo Mesa Lupine, Giant Kangaroo Rat, Tidewater Goby. Federally listed threatened species include: Western Snowy Plover, Southern Sea Otter, California Red-Legged Frog, California Tiger Salamander, Southern Pacific Steelhead Trout, and Vernal Pool Fairy Shrimp. Additionally, the Two-Striped Garter Snake is listed as a “species of special concern”. This will require a permit from the USFWS. The permit will be judged on both the national ESA and California ESA. The California specific species will be passed onto the CDFW.

Section 2b. Migratory Bird Treaty Act: The project construction and use will have impacts on endangered or listed migratory birds. This will trigger a specific permit requirement from the USFWS under the ESA. This permit will require the NEPA standards of significant impact to determine the threshold of significance for the project. Along with the USFWS decision to issue a permit for migratory bird habitat disturbance.

Section 3a. NOAA Fisheries Incidental Take Permit: Similar to the USFWS the implementation of intake/discharge pipelines has the possibility of incidental takes of NOAA fisheries listed species. This will require the NOAA fisheries agency to issue a permit for the project continuation. The NOAA fisheries will base standards of NEPA with similarly to USFWS. Possible problems that could arise from this permitting process is the large number of NOAA fishery permits the agency receives. It is possible for a long waiting period for permit approval.

State

Section 4a. NPDES Discharge into Ocean Waters Permit will need to be obtained from the CalEPA. Section 403 of the Clean Water Act stipulates that discharges to the territorial seas, contiguous zones, and oceans comply with regulatory requirements above and beyond those specifically defined under a typical NPDES permit. These requirements are intended to ensure that no reasonable degradation of marine environment occurs as a result of the discharge and that sensitive marine environments are protected.

Section 5a. The CCC has jurisdiction of the Coastal Zone, the project will occur within this Coastal Zone, both onshore through the construction and operation of the plant and the restoration component; and offshore through the intake/outlet pipelines. The CCC reviews and approves or denies all 404 permits for activities affecting the coastal zone, ensuring accordance with the California Coastal Management Plan. As discussed above, a Section 404 permit of the CWA will be initiated by USACOE then ultimately approved by the CCC.
Section 6a. The project has the potential to negatively affect state-protected or listed plant and animal species or their habitats with the construction of the plant, brine disposal, and other activity, triggering the need for a Section 2081 Incidental Take permit under the CESA by the CDFW. State-listed endangered species in the area include: Marsh Sandwort, Nipomo Mesa Lupine, and Giant Kangaroo Rat. State-listed threatened species in the area include: LaCrisoa Thistle, Southern Sea Otter, California Tiger Salamander, and Vernal Pool Fairy Shrimp. Species listed as “species of special concern” in California include: the Western Snowy Plover, Two-Striped Garter Snake, California Red-Legged Frog, Southern Pacific Steelhead Trout, and Tidewater Goby. The Red-Legged Frog has been observed within the BMP Area including Little Oso Flaco Lake. The BMP Area also supports two special status freshwater fish species – the Southern Pacific Steelhead Trout and Tidewater Goby. Seven special status insect species have been recorded in or adjacent to Oceano Dunes SVRA including the Oso Flaco Patch Butterfly, Oso Flaco flightless moth, globose dune beetle, obscure bumblebee, sandy beach tiger beetle, Oso Flaco robber fly, and monarch butterflies. Due to the number of listed species in and adjacent to the project area, a state Section 2081 Incidental Take Permit will be needed in addition to the federal USFWS Incidental Take Permit.

Section 6b. A Lake and Streambed Alteration Agreement will likely be needed and obtained by the CDFW as it is likely that the project construction, operation, or restoration component substantially diverts or obstructs the flow of, changes or use any material from, or deposit debris or materials of Little Oso Flaco Lake.

Regional
Section 7a. A NPDES Stormwater and Wastewater Permit will need to be obtained through the CCRWQCB, to regulate stormwater discharge from MS4’s, construction, and industrial activities as well as point source discharges into United States waters. Point sources such as pipes, ditches, or channels will likely be utilized in the project for various potential restoration activities. Pollutants including rock, sand, dirt, and industrial waste will potentially be discharged into Little Oso Flaco Lake during restoration activity as well as during the construction and operation of the plant into United States waters.

Section 7b. The CCRWQCB administers Section 401 of CWA and regulates the Waste Discharge Requirements program. A 401 Water Quality Certification (WDR Permit) will be needed due to the direct and indirect impacts to water quality that may result from the discharge of dredge or fill material from construction of the project and/or restoration of Little Oso Flaco Lake into United States waters.

6 Summary of Findings
Throughout this project, Bright, Nielhuson & Welsh identified key issue areas that could arise from the conversion of the Phillips 66 Santa Maria Refinery into the proposed Nipomo Mesa Desalination Facility. The focus of this analysis was on four specific issue areas: Aesthetics, Air Quality, Hydrology/Water Quality, and Energy. Each issue area was described and analyzed within the document through assumptions made about this specific project and with the help of previous work conducted for other similar desalination projects. These issue area descriptions
were used to identify potential environmental constraints that could occur within the construction phases and operational lifetime of the facility. A cradle to grave approach was used to encompass all possible constraints related to the project and our teams specific issue areas.

The environmental issue areas, possible constraints, and recommendations are the bulk of this environmental constraint report. Additionally, Bright, Nielhuson & Welsh defined the reason and purpose for the project, performed stakeholder analysis, and explored the environmental permitting process and requirements that would be necessary for project completion.

While the focus of the document was on the four environmental issue areas listed above, this was a class effort and other consulting teams worked to analyze the remaining environmental issue areas related to the project. This summary will encompass all issue areas defined by assumptions made about the conversion project. Figure 16 highlights all environmental issue areas in a final constraints map.

6.1 Summary of Constraints

While this document focused on four specific issue areas, collaboration with other groups led to the production of a final constraints map. The environmental issue areas that were deemed most critical for research are displayed in Figure 16 below for the purpose of visualizing potential constraints for the overall project.

Sensitive resource areas are highlighted due to the project’s proximity to the California State Park Oceano Dunes. This sensitive resource area includes federally and state listed species under the ESA. It also includes scenic vistas that could be affected by the project. This area was highlighted under the assumption that an intake/outlet pipeline would need to be constructed to feed the desalination plant. Since this environmental constraints report is based on assumptions, the potential impact’s significance could change if project details are altered.

Riparian vegetation and terrestrial habitat are also shown in the map because of the environmental footprint the project will have on the area. Again, because the project is based on assumptions defined by our teams, potential changes to these issue areas are possible. Due to the geology and soils of the project site and surrounding area, there is a high potential for liquefaction, which should be heavily considered. Areas of high potential for liquefaction are highlighted pink in the final constraints map. Finally, included on the map are permanent streams, lakes, and waterways because of the ecological services they provide to wildlife and also recreational opportunities.
Figure 16  Final Constraints Map

6.2 Discussion

The proposed Nipomo Mesa Desalination facility is a theoretical conversion project for which constraints have been analyzed. The issue areas were chosen are based on Bright, Nielhuson & Welsh Consulting’s areas of expertise and the most significant impacts to the surrounding environmental communities. Since this project is theoretical and based on only one of many possible futures for the current Phillips 66 site, many assumptions were made in the creation of this constraint report. It is important to state that this constraint analysis is based on specific project design outlined in the project description of this report.

The difficult part of this project was finding real world significant research and combining it with unknown theoretical project design. This leaves the constraints reported in this document up for possible changes. Many different designs for desalination plants exist and research for new technologies for freshwater resources is expanding. Bright, Nielhuson & Welsh Consulting worked from the basis that the Nipomo Mesa Desalination facility would implement the best technology available, while still attempting to mitigate the environmental impacts to the standard of current available technologies.
Throughout the process of this environmental constraint report, the complexity of the project components was highlighted. Many stakeholders, NGOs, and government agencies would become involved in this project. The stakeholder analysis demonstrated the number of parties that would be involved in this project and what role they would play in project completion. This leads into the complex permitting requirements for this project.

Federal, state, and local permit requirements were examined for the proposed Nipomo Mesa Desalination facility. It is clear that because of the location of this project and the required infrastructure changes to the existing site, an extensive amount of agency involvement is required. The multi-level complexity highlights the importance of documents like this one to help people better understand how these projects come to life.

As climate change increases the severity of drought and a growing population increases the need for available water, desalination plants have come to the forefront of technological developments. Exploring those technologies and the environmental impacts of desalination facilities has been a very rewarding experience for the team members of Bright, Nielhuson & Welsh Consulting.

7 List of Preparers

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8 References


6. Attendant, A. A., Directory, F. W. O. C. O. to A. a N., Park, L. to R. I. A. the, pm, or speak with a ranger P. note that if you are calling between 4:30, Am, 10, & Us, park staff may not be available to answer your call C. (n.d.). *Coastal Dune Habitat Restoration Projects—Point Reyes National Seashore (U.S. National Park Service).* Retrieved June 8, 2021, from https://www.nps.gov/pore/learn/management/planning_dunerestoration.htm


