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W14b

Addendum

December 5, 2016

To: Commissioners and Interested Persons

From: California Coastal Commission
San Diego Staff

Subject: Addendum to **Item W14b**, Coastal Commission Permit Application **#6-16-0275 (San Elijo Lagoon Conservancy and Caltrans San Elijo Lagoon Restoration)**, for the Commission Meeting of December 7, 2016

The purpose of this addendum is to make modifications and additions to the staff report to clarify lagoon and marine ecosystem monitoring requirements; modify Special Condition No.9, Final Surf Monitoring Plan, to clarify that surf monitoring will be conducted for six months and if results indicate that significant impacts to surfing resources persist at the end of the six month monitoring period, an additional six months of monitoring shall be required; update Special Condition No. 20, Archaeological Monitoring and Mitigation Plan, to reflect the Commission's most recent condition language regarding archaeological monitoring and mitigation; and attach three public comment letters. Deletions shall be marked by a ~~strikethrough~~ and additions shall be underlined:

1. On page 2 of the staff report, the first paragraph under the "Project Background, Purpose, and Description," shall be modified as follows:

   San Elijo Lagoon is located within the San Elijo Ecological Reserve, in the southernmost part of the City of Encinitas, and is owned and managed by the California Department of Fish and Wildlife (CDFW), County of San Diego Parks and Recreation Department, and the San Elijo Lagoon Conservancy. San Elijo Lagoon is a coastal wetland with substantial biological and ecological resources important to the region. The lagoon provides habitat that supports sensitive species, including federally threatened and endangered plants and animals, and resident and migratory wildlife. A mosaic of habitats occurs, linked directly to tidal inundation and frequency, and the species that utilize the lagoon vary by habitat.

2. On page 9, add a new exhibit (Exhibit No. 18, Public Comment Letters) that includes public comment letters attached to this addendum from the following:
   - County of San Diego

- San Diego County Surfrider
- Peter B Ernst DVM, PhD

3. On page 11 of the staff report, Special Condition 1, Final Wetland Habitat and Hydrology Plan, shall be modified as follows:

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for review and written approval of the Executive Director, a final detailed Lagoon-wide monitoring plan designed by a qualified wetland and upland restoration ecologist for comprehensive monitoring of the lagoon mitigation site, including the tidal inlet, that substantially conforms with the monitoring program titled "Draft Physical and Biological Monitoring Plan for the San Elijo Lagoon Restoration Project" prepared by Nordby Biological Consulting and dated July 2016. The Monitoring Plan shall, at a minimum, include the following:

(a) A plan for construction phase and post-project monitoring and maintenance of all restoration areas. The plan shall include provisions for data sharing with University of California Santa Barbara (UCSB) contract scientists. Data and data analysis products shall be obtained from the San Dieguito restoration site and from the reference sites associated with this restoration as applicable. If comparisons do not include all reference sites, wetlands that will be used for reference shall be specified in the plan. In addition, this plan shall include:

i. A verification upon completion that the "as-built" restoration condition of each basin conforms to the conditions described in the restoration plan.

ii. A schedule that describes the time period over which monitoring activities will take place in each of the three lagoon basins, including upland areas and the tidal inlet.

iii. A description of field monitoring activities that includes sampling design, number of samples and sampling methods for all categories listed in the monitoring plan as is appropriate, including topography, bathymetry, tidal amplitude, water quality, soils, benthic invertebrates, fish and birds, and all restored habitat types. The response variables used to assess the relative performance standards of the SELRP (hereafter referred to as "relative performance variables") shall be similar to those of the existing pre-restoration lagoon system, and of reference wetland habitats. Evaluating whether a particular relative performance variable (e.g., benthic macroinvertebrate diversity) at the SELRP is verifiably improved compared to pre-restoration conditions, and similar to the reference wetlands requires that the mean value for the performance variable at the San Elijo Lagoon wetlands not be significantly worse than the mean value at the worst performing reference wetland, or of the pre-restoration condition of lagoon habitats. A one sample, one tailed approach shall be used to evaluate all such comparisons. An additional analysis shall analyze and describe differences

between the baseline conditions and the post-restoration conditions, and specifically how these changes conform to project goals as laid out in the project objectives section 1.2 of the Final Environmental Impact Report for the San Elijo Lagoon Restoration Project (FEIR), adopted February 2016.

iv. Performance standards shall be developed for a 10-year monitoring schedule for tidal wetlands and a 5-year monitoring schedule for all upland habitats and other aquatic resource types or longer if performance standards are not met in the initial time frame. Standards for specific categories shall ensure all of the following, as applicable:

A. *Topography.* The lagoon system not undergo major topographic degradation (such as excessive erosion or sedimentation) and maintain a specified final wetland acreage amount for each habitat type, (*e.g.* low, mid and high marsh), and tidal elevation within 10 percent of initial habitat objectives.

B. *Water Quality.* Water quality variables, including, at a minimum, dissolved oxygen, seasonal percentage of eutrophic conditions, and turbidity, shall be evaluated through comparison with reference wetlands or aquatic habitat and relative to baseline conditions. Specific metrics shall be determined for these water quality variables and require approval by the Executive Director. Water temperature, water depth, salinity, pH (and any additional explanatory variables) shall also be monitored to inform interpretive analyses and remedial action if required.

C. *Tidal Prism.* The designed tidal prism shall be achieved and maintained for all lagoon basins, and tidal flushing may not be interrupted during all times that the lagoon inlet is open.

D. *Habitat Areas.* The area of different habitats may not vary by more than 10% from the area indicated in the final Habitat Monitoring and Maintenance Plan.

E. *Biological Communities.* Within five years of restoration, community composition and the total densities and number of species of fish, macroinvertebrates and birds shall be similar to ~~that in similar~~ habitats in the reference wetlands, where applicable, and enhanced from the pre-restoration condition.

F. *Vegetation*. The proportion of total vegetative cover and open space and plant species diversity in each habitat type shall be similar to those proportions and diversity found in the reference sites and enhanced from pre-restoration conditions in both planted and unplanted habitat types upon project completion. The percentage cover of algae shall be similar to the percent cover found in the reference sites.

G. *Spartina Canopy Architecture*. Among wetland locations that achieve the salinity levels and elevations to support native spartina, or which supported spartina prior to restoration, the restored wetland areas shall have a canopy architecture that is similar in distribution to pre-restoration conditions~~the reference sites~~, with an equivalent proportion of stems over three feet tall, five years following restoration.

H. *Food Chain Support*. The food chain support provided to birds shall be similar to that provided by the reference sites, if applicable, and enhanced relative to pre-restoration conditions, as determined by feeding activity of the birds.

I. *Exotics*. The important functions of the wetland not be impaired by exotic species, including zero percent coverage that shall be maintained for California Invasive Plant Council's "Invasive Plant Inventory" species, and no more than five percent coverage for other exotic/weed species.

v. On an annual basis, the applicant shall submit for the review and written approval of the Executive Director, a monitoring report for the inlet maintenance portion of the project. The report shall be submitted annually beginning the first year after Commission approval of the permit. The report shall summarize the effects of the multiple openings, including any changes in the tidal prism caused by external factors (such as upstream development impacts, extreme storm conditions, unusual tides, etc.) that may have contributed to the need for the lagoon inlet openings as well as the inlet breaching's impacts on the biological productivity of the lagoon. Specifically, the annual report shall include the following information:

A. The date of the opening(s) which occurred, along with the date of each subsequent closure and the date of any maintenance dredging;
B. Photos of the beach in front of the lagoon inlet prior to and during dredging activities; and
C. Any noted adverse impacts on lagoon, beach, or dune resources or adjacent park and recreation areas resulting from dredging or disposal activities, and recommendations to avoid or mitigate these impacts in the future.

vi. Interim and final performance standards for all restored habitat types. The applicant shall be fully responsible for any failure to meet assigned performance standards. The REMP Working Group and their Scientific Advisory Committee, may modify performance standards based on site conditions if modified performance standards are equal to or superior to the originally approved standards. If approved performance standards are not achieved, the REMP Working Group shall prescribe remedial measures with guidance from the REMP Scientific Advisory Committee, and the measures shall be ~~immediately~~ implemented by the applicant. If the applicant does not

agree that remediation is necessary, the Executive Director may set the matter for hearing by the Coastal Commission.

vii. Monitoring that documents changes in sea level rise, sediment dynamics, and the overall health of the wetland to allow for adaptive management, as needed. The Long-Term Management Plan (LTMP) outlined in Special Condition 1(a)x ~~plan~~ shall include triggers for implementing adaptive management options as appropriate if sea level rise is found to outstrip current projections over the life of the project.

viii. Provision for submission of annual reports of monitoring results to the Executive Director for the duration of the required monitoring period, beginning the first year after submission of the "as-built" report for each basin. Each report shall be cumulative and shall summarize all previous results. Each report shall document the condition of the restoration with photographs taken from the same fixed points in the same directions. Given the scale of the restoration, these fixed points shall be representative of the restoration footprint and shall document changes across a variety of habitat types. Each report shall also include a "Performance Evaluation" section where qualitative observations and quantitative results from the monitoring plan and subsequent data analysis are used to evaluate the status of the restoration project in relation to the interim performance standards and final success criteria.

ix. Provisions for a revised or supplemental restoration plan to be submitted if an annual monitoring report shows that the restoration effort is falling significantly below the interim performance standards. Triggers shall be included in the plan to define the level of nonperformance at which the submittal of a revised or supplemental restoration plan shall be required. The applicant shall submit a revised or supplemental restoration program within 90 days of submittal of an annual report in which significant and ongoing failure to meet performance standards is documented. This supplemental restoration program shall address those portions of the original program which did not meet the approved success criteria, and shall include a description of the adaptive management actions to be taken to ensure success criteria are met.

x. Provisions for the development of a long-term monitoring and management plan to be developed in consultation with the permittee and appropriate resource agencies, and to provide an overall framework to guide the long-term future conditions of the lagoon in anticipation of future sea level rise and any climatic or other changes that may impact the lagoon and its ecology. It shall include an overall description of the monitoring studies to be conducted over the life of the project, for a minimum of 50 years, and shall be designed to provide the information necessary to detect physical and biological changes and adjust management actions in light of evolving management goals.

(b) Final Success Criteria for each habitat type, including, as appropriate,

i. total species richness for benthic invertebrates, fish, birds, and plants;
ii. total ground cover of all vegetation and of native vegetation;
iii. total habitat acreage;
iv. vegetative cover of dominant species;
v. wildlife usage in the lagoon including types and frequency of wildlife species;
vi. usage by special status species, including the Western snowy plover, the California Least tern, the Light-footed Ridgway's rail, Least Bell's vireo, Belding's Savanna sparrow and the Southwestern willow flycatcher;
vii. hydrology, including timing, duration and location of water movement; and
viii. presence and abundance of sensitive species or other individual "target" species.

(c) Final Success Criteria for all physical and chemical parameters including, at a minimum:

i. topography;

ii. bathymetry;

iii. tidal amplitude;

iv. water quality; ~~and~~

v. soils~~.~~; and

vi. storm flow conveyance.

(d)~~.~~ The method by which "success" shall be judged, including:

i. The types of comparisons that shall be implemented, including absolute and relative standards comparisons to reference sites and baseline data, data analysis methods, and statistical tests to be performed to confirm that performance standards are met. Methods of analysis and confirmation of performance standards shall be determined in consultation with the staff ecologists of the Coastal Commission, and with representatives from the REMP and the REMP Scientific Advisory Committee;
ii. Identification and description, including photographs, of any high functioning, relatively undisturbed reference sites that shall be used, including the San Dieguito Lagoon Restoration and associated reference wetlands as applicable, as well as baseline conditions within the lagoon; and

iii. Test of similarity with the chosen reference site(s), as applicable, and relative to baseline conditions. This could simply be determining whether the result of a census was above a predetermined threshold. Generally, it shall entail a one- or two-sample t-test that determines if differences between the restoration sites and the reference site and post-restoration conditions are within the maximum allowable difference for each success criteria or performance standard.

(e) Provisions for submission of a final monitoring report to the Executive Director at the end of the final monitoring period. The final report shall be prepared by a qualified restoration ecologist. The report shall evaluate whether the restoration site conforms to the goals, objectives, and success criteria set forth in the approved final restoration program. The report shall address all of the monitoring data collected over the monitoring period. Following the restoration, reports shall be submitted every ten years to ensure that the restoration is maintained over the life of the restoration, which is presumed to be at least 50 years post-restoration.

(f) If the final report indicates that the restoration project has been unsuccessful, in part, or in whole, based on the approved success criteria (performance standards), the applicant shall submit within 90 days a revised or supplemental restoration program to compensate for those portions of the original plan that did not meet the approved success criteria. The permittee shall undertake mitigation and monitoring in accordance with the approved final, revised wetland restoration plan following all procedures and reporting requirements as outlined for the initial plan.

The permittee shall undertake development in conformance with the approved final plan unless the Commission amends this permit or the Executive Director provides a written determination that no amendment is legally required for any proposed minor deviations.

4. On page 17 of the staff report, Special Condition 4(b), Pre-Construction Biological Surveys and Monitoring During Construction, shall be modified as follows:

Pre-Construction Biological Surveys. In the event that the environmental resources specialist reports finding any federally or state-designated sensitive wildlife species (including but not limited to ~~California grunion,~~ western snowy plover, or California least terns) exhibiting reproductive or nesting behavior during the pre-construction surveys, the applicant shall delay work, and promptly notify the Executive Director, CDFW, and USFWS. Project activities may commence only upon written approval of the Executive Director, following consultation with CDFW and USFWS.

5. On page 18 of the staff report, Special Condition 5, Marine Ecosystem Monitoring and Mitigation Plan, shall be modified as follows:

Marine Ecosystem Monitoring, Adaptive Management and Mitigation Plan

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director, for review and written approval, a final Marine Ecosystem Monitoring, Adaptive Management and Mitigation Plan for monitoring the physical structures and biological communities of the three (3) following marine ecosystems: sandy beach, rocky intertidal, and subtidal rocky reef. The monitoring, adaptive management and mitigation plan shall provide an overall framework to guide monitoring of the physical structures and biological communities associated with these marine ecosystems, in and immediately adjacent to the Cardiff State Beach and Fletcher Cove replenishment footprints, as well as a minimum of two (2) reference sites for each respective ecosystem. The plan shall also provide adaptive management and mitigation options for potential impacts to these intertidal and subtidal marine ecosystems. The monitoring, adaptive management and mitigation plan shall be developed in consultation with state and federal agencies including the California Department of Fish and Wildlife, California State Lands Commission, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and U.S. Army Corps of Engineers.

(a) Marine Ecosystem Monitoring Plan. The Marine Ecosystem Monitoring Plan shall describe the sampling methods, analytical techniques, criteria, and assessment approaches for determining whether the approved project has exerted significant changes, including adverse impacts upon the respective marine ecosystems. The terms 'direct' and 'indirect' as they relate to definition of change ~~adverse impacts~~ shall refer to their spatial (within and outside of permitted replenishment footprint areas) and temporal (whether temporary or permanent) nature ~~of any observed changes~~, as well as their severity (sub-lethal or lethal). The monitoring plan shall include clear and specific identification of the potential impact areas (in sandy beach, rocky intertidal, and subtidal rocky reef ecosystems) within and near the beach replenishment project footprints. It shall also specify two (2) reference sites for each of the ecosystems (sandy beach, rocky intertidal, and subtidal rocky reef), which are preferably located together. The marine ecosystem monitoring locations in the immediate project area shall be established based upon the project footprint and model-predicted sedimentation patterns. Reference site locations shall be based on similarity to the respective marine ecosystems in the project area and proximity to the project area. In addition the plan shall include, at a minimum, the following:

i. Existing Conditions. The plan shall include a description and historical review of the physical structures and biological communities of the sandy beach (i.e., sand specifications, wrack, infaunal invertebrates), rocky intertidal (i.e., rock size and type, algae, sessile and motile invertebrates), and subtidal rocky reef (i.e., rock size and type, algae, sessile and motile invertebrates) marine ecosystems in the vicinity of the beach replenishment project sites. The historical review shall include a summary of past quantitative survey and monitoring work ~~(e.g., annual kelp canopy areal extent data, Marine Protected Area Monitoring Enterprise, Multi-Agency Rocky Intertidal Network survey work)~~ conducted on these ecosystems, in order to document trends in areal extent, species composition, and community structure and dynamics for comparison with the post-project monitoring results.

ii. Monitoring Objectives. The monitoring objectives shall include:

A. Fine-scale mapping of physical structures via remote-sensing techniques associated with the sandy beach, rocky intertidal, and subtidal rocky reef ecosystems, within the vicinity of the project footprints and at a minimum of two (2) reference sites;

B. Quantitative characterization of biological communities via in situ field methods for sandy beach, rocky intertidal, and subtidal rocky reef ecosystems including algal and invertebrate (infaunal for beaches, sessile and motile for rocky ecosystems) components, within the vicinity of the project footprints and at a minimum of two (2) reference sites;

C. Identification of any direct or indirect changes ~~adverse impacts~~ (with respect to space, time, and severity) to sandy beach, rocky intertidal, or subtidal rocky reef ecosystems resulting from the project;

D. And, identification of likely causes of any documented changes ~~adverse impacts~~ to the sandy beach, rocky intertidal, or subtidal rocky reef ecosystems, including but not limited to burial, scouring, and turbidity.

iii. Monitoring Design. Monitoring shall be divided into two (2) distinct phases utilizing the same monitoring design. The fall season shall be defined as from September 1 to November 30.

A. Fall pre-construction monitoring shall be completed prior to commencement of project construction to establish pre-project baseline conditions.

B. Post-construction annual fall monitoring shall be completed for five (5) years following the completion of all sand placement activities.

iv. Monitoring Methods. The plan shall include detailed monitoring methods and a schedule for their execution with the intention of meeting the monitoring objectives; specifically, methods to monitor for and quantify potential direct and indirect changes ~~adverse impacts~~ to sandy beach, rocky intertidal, and subtidal rocky reef ecosystems, within the project footprint and at a minimum of two (2) reference sites. At a minimum, the applicant shall incorporate the following methods in the final plan:

A. Remote-Sensing Census of Physical Structures. Remote-sensing census techniques shall be used to map sandy beach, rocky intertidal, and subtidal rocky reef ecosystems in the project areas, and at a minimum of two (2) reference sites outside the influence of the project areas, with the highest accuracy possible. This shall address areas of:

1) Rocky intertidal, including areas with and without surfgrass, via aerial imagery;

2) Subtidal rocky reefs, including areas with and without kelp, via side scan sonar;

3) Kelp canopy, via aerial imagery; and

4) Beach wrack, via aerial imagery.

B. In Situ Intertidal and Subtidal Field Sampling. The intertidal and subtidal field sampling methods employed shall be capable of characterizing finer-scale physical structures and the biological communities of the sandy beach, rocky intertidal, and subtidal rocky reef ecosystems. Physical sampling shall document substrate relief and rugosity, available crevices and vertical surfaces, and sand cover. Biological sampling shall document the beach infaunal invertebrate and rocky intertidal and subtidal rocky reef algal and invertebrate (sessile and motile) community structures.

The intertidal and subtidal field sampling of sandy beach, rocky intertidal, and subtidal rocky reef ecosystems shall be designed to detect ~~discover pick up~~, at a minimum, a 20% effect size ~~change~~ between the ~~respective~~ impact and reference sites, with >80% statistical power. ~~The proposed replication shall be based on~~ Ppreliminary sampling data and analyses shall be conducted in order to determine the replication required to meet these design criteria ~~a statistical power analysis~~.

v. Criteria for Detecting Adverse Impacts. The plan shall include criteria (relative or fixed) for determining whether the project has resulted in direct or indirect adverse impacts (spatial, temporal, or varying degrees of severity) upon sandy beach, rocky intertidal, or subtidal rocky reef ecosystems. The criteria shall be amenable to quantitative assessment and shall include estimates of the areas of ecosystem lost or significantly impacted as a result of the project ~~(e.g. substrate relief and rugosity, available crevices and vertical surfaces, sand cover, and habitat-forming species such as kelp and surfgrass)~~. The criteria shall also address significant changes in the structure and function of the biological communities ~~(e.g., number and abundances of algal and invertebrate species, invasive species, recruitment, guild) due to adverse impacts~~ resulting from the project.

vi. Quantitative Criteria Assessment. An integrated assessment approach based upon annual monitoring results shall be developed to determine whether the project has resulted in adverse impacts to the sandy beach, rocky intertidal, or subtidal rocky reef ecosystems. When assessing census criteria relative to the reference sites, and in order to safeguard against the potential asymmetry of false positive and false negative errors in census data, these errors shall be measured and taken into account.

Individual sampling criteria shall be assessed by any statistically significant differences relative to the reference sites. ~~Where α is between 0.000-0.500, and α ≤ effect size it shall be concluded that the respective criteria is unmet and therefore out of compliance, and when α > effect size, the respective criteria is met and shall be considered in compliance. Where α > 0.500 and~~

~~effect size > 0.500, compliance with the respective criteria shall be considered inconclusive and require further examination.~~

It shall be assumed that any statistically significant adverse impact that is detected is a result of the project unless the applicant can provide compelling evidence to the contrary ~~(e.g., development of local urchin barrens, wastewater spills, or other localized catastrophic events)~~.

An assessment with respect to potential mitigation requirements shall be made following the final year of monitoring.

vii. Monitoring Reports. Annual reports shall include a review of all previous monitoring and provide results from the most recent event, and shall be submitted no later than March 31 of the following year for review and approval by the Executive Director. A report at the end of the 5-year monitoring term shall determine whether any adverse impacts to marine ecosystems have occurred as a result of the project. If adverse impacts are determined to have occurred after the 5-year review, the Executive Director will assess the need for any adaptive management and mitigation.

(b) Marine Ecosystem Adaptive Management, Mitigation and Monitoring. If it is determined that the project has imposed direct or indirect adverse impacts on any of the marine ecosystems being monitored (sandy beach, rocky intertidal, and/or subtidal rocky reefs), recommendations for adaptive management shall be developed and provided to the Executive Director for consideration. If it is determined that adaptive management strategies alone would be insufficient to compensate for the loss of or significant impacts to the ecosystem, mitigation may ~~shall~~ be necessary. Under such circumstances, an appropriate mitigation ratio for impacts upon marine ecosystems shall be determined by the Executive Director at the time that adverse impacts are reported.

In response to any mitigation needs, the applicant shall develop an ecosystem-specific mitigation plan for each impacted ecosystem, which shall provide the overall framework to guide the mitigation work, for review and approval of the Executive Director. The revised mitigation and monitoring program shall be processed as an amendment to the coastal development permit unless the Executive Director determines that no permit amendment is required.

6. On page 24 of the staff report, Special Condition 8(b)iv, Shoreline Monitoring Plan, shall be modified as follows:

iv. A site specific determination of the current location of the Mean High Tide Line (MHTL) shall be conducted at the beach receiver sites prior to ~~following~~ beach nourishment, with the consultation and written confirmation of the State Lands Commission.

7. On page 24 of the staff report, Special Condition 9, Surf Monitoring Plan, shall be modified as follows:

Final Surf Monitoring Plan

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director, for review and written approval, a Final Surf Monitoring Plan to visually monitor surfing conditions at and adjacent to Cardiff State Beach and Fletcher Cove before and after sand placement. The Final Surf Monitoring Plan shall be in substantial conformance with the "Surfing Monitoring Program Overview," submitted to the Commission on November 16, 2016~~.~~, except that if results indicate that significant impacts to surfing resources persist at the end of the six month monitoring period, an additional six months of monitoring shall be required.~~, and shall include, at a minimum, the following:~~

~~(a) Identify the major surfing breaks at and adjacent to Cardiff State Beach and Fletcher Cove and determine appropriate monitoring sites;~~

~~(b) Document morning conditions on video and/or using a standardized data sheet, as follows:~~

~~i. Pre-construction monitoring shall begin two weeks prior to sand placement, and take place 3 times per week over 14 days; and~~
~~ii. Post-construction monitoring shall begin within two weeks following completion of sand placement, and take place 3 times per week over 30 days.~~

~~(c) Surf monitoring shall include estimates of wave height, type of wave (hollow or mushy), breaker distance from shore, length of peel, and existence of backwash;~~

~~(d) Conduct standardized interviews with surfers using a questionnaire;~~

~~(e) Estimate the density of surfers at each site surfing site during monitoring; and~~

(f) ~~A final report that includes the monitoring results and an analysis of any change in surfing conditions shall be submitted to the Executive Director within 90 days of the final survey.~~

The permittee shall undertake development in conformance with the approved final plan unless the Commission amends this permit or the Executive Director provides a written determination that no amendment is legally required for any proposed minor deviations.

8. On page 25 of the staff report, Special Condition No. 10, Sand Placement Plan, shall be modified as follows:

~~By acceptance of this permit, the applicant agrees to employ the following best management practices when conducting beach nourishment activities, to the extent feasible:~~
PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director, for review and written approval, a Sand Placement Plan for conducting beach nourishment activities. The Sand Placement Plan shall

demonstrate that sand placement activities comply with the following best management practices, set forth in Defeo et al. (2009) to the extent feasible:

(a) Avoidance of sediment compaction;

(b) Careful timing of operations to minimize biotic impacts and enhance recovery;

(c) The selection of locally appropriate techniques;

(d) The implementation of several small projects rather than a single large project, including repeated application of sediment in shallow layers (<30cm) rather than single pulses that kill fauna by deep burial;

(e) Interspersion of nourished beach sections with unaffected areas; and

(f) Importing sediments and creating beach profiles that match the original beach conditions as closely as possible.

9. On page 25 of the staff report, Special Condition 12(a)iii, Final Plans, shall be modified as follows:

   iii. The plans may eliminate the two upland transitional areas in the southern portion of the central basin.

10. On page 26 of the staff report, Special Condition 13(a)i, Construction and Pollution Prevention Plan, shall be modified as follows:

   i. Staging and storage of construction equipment and materials (including debris) may not take place on the beach, except for dredged pipeline segments. Staging and storage of construction equipment and materials shall occur in inland areas at least 50 feet from coastal waters, drainage courses, and storm drain inlets, if feasible. Upon a demonstration of infeasibility due to site constraints, the applicant may submit a request for review and written approval to the Executive Director for staging and storage of construction equipment and materials closer than 50 feet from coastal water, drainage courses, and storm drain inlets. Construction is prohibited outside of the defined construction, staging, and storage areas.

11. On page 28 of the staff report, Special Condition 13(e)ii, Construction and Pollution Prevention Plan, shall be modified as follows:

    ii. All construction equipment and materials shall be stored beyond the reach of tidal waters. All construction equipment and materials shall be removed in their entirety from the beach area by sunset each day that work occurs. The only exceptions may be during active construction at night, and for erosion and sediment controls and/or construction area boundary fencing, where such controls and/or fencing are placed as close to the base of the seawall/bluff or back of the beach as possible, and are minimized in their extent.

12. On page 31 of the staff report, Special Condition 17, As-Built Plans, shall be modified as follows:

    WITHIN 30 DAYS OF COMPLETION OF CONSTRUCTION, the permittee shall submit two copies of As-Built Plans showing all development completed pursuant to this coastal development permit. The As-Built Plans shall be substantially consistent with the approved project plans described in Special Condition 12 above, including all of the same informational requirements specified in those plans. The As-Built Plans shall include a graphic scale and all elevations shall be described in relation to ~~National Geodetic~~ North American Vertical Datum of 1988 (NA~~G~~VD88) ~~88~~. The As-Built Plans shall be submitted with certification by a licensed civil engineer with experience in coastal structures and processes, acceptable to the Executive Director, verifying that the project has been constructed in conformance with the approved final plans.

    The As-Built Plans for the riprap protection on the tidal inlet shall include color photographs that clearly show all components of the as-built project, and that are accompanied by a site plan that notes the location of each photographic viewpoint and the date and time of each photograph. At a minimum, the photographs shall be from representative viewpoints of ~~from~~ the inlet showing views of the entire reach of stone placement. ~~located directly upcoast, downcoast, seaward, and landward of the project site.~~

13. On page 32 of the staff report, Special Condition 20, Archaeological Resources and Monitoring, shall be deleted and replaced in its entirety as follows:

    Archaeological Monitoring and Mitigation Plan

    A. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit for the review and written approval of the Executive Director an Archaeological Monitoring and Mitigation Plan for the protection of archaeological/cultural resources during project grading and construction activities, prepared by an appropriately qualified professional, consistent with Subsections E and F of this condition, which shall incorporate the following measures and procedures:

    1. During all digging, ground disturbance, and subsurface activity within intact stable sediment on the site, archaeological monitor(s) qualified by the California Office of

Historic Preservation (OHP) standards and the Native American most likely descendants (MLDs) from each tribe when State Law mandates identification of MLDs, shall be present on the site.

2. Also present during all digging, ground disturbance, and subsurface activity within intact stable sediment on the site shall be a minimum of 1 Native American monitor for every location of ground disturbance.

3. More than 1 monitor on the site may be necessary during times with multiple grading and soil disturbance locations.

4. The permittee shall provide sufficient archaeological and Native American monitors to assure that all project grading or other development that has any potential to uncover or otherwise disturb cultural deposits is monitored at all times. All archaeological monitors, Native American monitors and Native American most likely descendants (MLD) shall be provided with a copy of the approved archaeological monitoring and mitigation plan required by this permit. Prior to commencement of grading, the applicant shall convene an on-site pre-grading meeting with the all archaeological monitors, Native American monitors and Native American most likely descendants (MLD) along with the grading contractor, the applicant and the applicant's archaeological consultant in order to ensure that all parties understand the procedures to be followed pursuant to the subject permit condition and the approved archaeological monitoring and mitigation plan, including the procedures for dispute resolution. At the conclusion of the meeting all attendees shall be required to sign a declaration, which has been prepared by the applicant, subject to the review and approval of the Executive Director, stating that they have received, read, discussed and fully understand the procedures and requirements of the approved archaeological monitoring and mitigation plan and agree to abide by the terms thereof. The declaration shall include contact phone numbers for all parties and shall also contain the following procedures to be followed if disputes arise in the field regarding the procedures and/or terms and conditions of the approved archaeological monitoring and mitigation plan. Prior to commencement of grading a copy of the signed declaration shall be given to each signatory and to the Executive Director.

(a) Any disputes in the field arising among the archaeologist, archaeological monitors, Native American monitors, Native American most likely descendants (MLD), the grading and construction contractors or the applicant regarding compliance with the procedures and requirements of the approved archaeological monitoring and mitigation plan shall be promptly reported to the Executive Director via e-mail and telephone.

(b) All work shall be halted in the area(s) of dispute. Work may continue in area(s) not subject to dispute, in accordance with all provisions of this special condition.

(c) Disputes shall be resolved by the Executive Director, in consultation with the archaeological peer reviewers, Native American monitors, Native American MLD, the archaeologist and the applicant.

(d) If the dispute cannot be resolved by the Executive Director in a timely fashion, said dispute shall be reported to the Commission for resolution at the next regularly scheduled Commission meeting.

5. If any cultural deposits are discovered during project grading or construction, including but not limited to skeletal remains and grave-related artifacts, traditional cultural sites, religious or spiritual sites, or other artifacts, the permittee shall carry out significance testing of said deposits and, if cultural deposits are found by the Executive Director to be significant pursuant to Subsection C of this condition and any other relevant provisions, additional investigation and mitigation in accordance with all subsections of this special condition;

6. If any cultural deposits are discovered, including but not limited to skeletal remains and grave-related artifacts, traditional cultural sites, religious or spiritual sites, or other artifacts, all development shall cease in accordance with Subsection B of this special condition;

7. In-situ preservation and avoidance of cultural deposits shall be considered as the preferred mitigation option, to be determined in accordance with the process outlined in this condition, including all subsections. A setback shall be established between the boundary of cultural deposits preserved in-situ and/or reburied on-site and any proposed development; the setback shall be no less than 50 feet and may be larger if necessary to protect the cultural deposits;

8. If human remains are encountered, the permittee shall comply with applicable State and Federal laws. Procedures outlined in the monitoring and mitigation plan shall not prejudice the ability to comply with applicable State and Federal laws. The range of investigation and mitigation measures considered shall not be constrained by the approved development plan. Where appropriate and consistent with State and Federal laws, the treatment of remains shall be decided as a component of the process outlined in the other subsections of this condition.

B. Discovery of Cultural Deposits. If an area of cultural deposits, including but not limited to skeletal remains and grave-related artifacts, traditional cultural sites, religious or spiritual sites, or other artifacts, is discovered during the course of the project, all grading and construction activities in the area of the discovery that have any potential to uncover or otherwise disturb cultural deposits in the area of the discovery and all construction that may foreclose mitigation options or the ability to implement the requirements of this condition shall cease and shall not recommence except as provided in Subsections C and D and other subsections of this special condition. In general, the area where construction activities must cease shall be 1) a physical buffer around the

cultural deposit; and 2) no more than the residential enclave area within which the discovery is made.

C. Significance Testing Plan Required Following the Discovery of Cultural Deposits. An applicant seeking to recommence construction following discovery of the cultural deposits shall submit a Significance Testing Plan for the review and approval of the Executive Director. The Significance Testing Plan shall identify the testing measures that will be undertaken to determine whether the cultural deposits are significant. The Significance Testing Plan shall be prepared by the project archaeologist(s), in consultation with the Native American monitor(s), and the Most Likely Descendent (MLD) when State Law mandates identification of a MLD. Once a plan is deemed adequate, the Executive Director will make a determination regarding the significance of the cultural deposits discovered.

(1) If the Executive Director approves the Significance Testing Plan and determines that the Significance Testing Plan's recommended testing measures are de minimis in nature and scope, the significance testing may commence after the Executive Director informs the permittee of that determination.

(2) If the Executive Director approves the Significance Testing Plan but determines that the changes therein are not de minimis, significance testing may not commence until after the Commission approves an amendment to this permit.

(3) Once the measures identified in the significance testing plan are undertaken, the permittee shall submit the results of the testing to the Executive Director for review and approval. The results shall be accompanied by the project archeologist's recommendation as to whether the findings should be considered significant. The project archeologist's recommendation shall be made in consultation with the Native American monitors and the MLD when State Law mandates identification of a MLD. If there is disagreement between the project archeologist and the Native American monitors and/or the MLD, both perspectives shall be presented to the Executive Director. The Executive Director shall make the determination as to whether the deposits are significant based on the information available to the Executive Director. If the deposits are found to be significant, the permittee shall prepare and submit to the Executive Director a supplementary Archeological Plan in accordance with Subsection D of this condition and all other relevant subsections. If the deposits are found to be not significant by the Executive Director, then the permittee may recommence grading in accordance with any measures outlined in the significance testing program.

D. Supplementary Archaeological Plan Required Following an Executive Director Determination that Cultural Deposits are Significant. An applicant seeking to recommence construction following a determination by the Executive Director that the cultural deposits discovered are significant shall submit a Supplementary Archaeological Plan for the review and approval of the Executive Director. The Supplementary

Archeological Plan shall be prepared by the project archaeologist(s), in consultation with the Native American monitor(s), the Most Likely Descendent (MLD) when State Law mandates identification of a MLD. The supplementary Archeological Plan shall identify proposed investigation and mitigation measures. If there is disagreement between the project archeologist and the Native American monitors and/or the MLD, both perspectives shall be presented to the Executive Director. The range of investigation and mitigation measures considered shall not be constrained by the approved development plan. Mitigation measures considered shall range from in-situ preservation to recovery and/or relocation. A good faith effort shall be made to avoid impacts to cultural resources through methods such as, but not limited to, project redesign, capping, and creating an open space area around the cultural resource areas. In order to protect cultural resources, any further development may only be undertaken consistent with the provisions of the final, approved, Supplementary Archaeological Plan.

(1) If the Executive Director approves the Supplementary Archaeological Plan and determines that the Supplementary Archaeological Plan's recommended changes to the proposed development or mitigation measures are de minimis in nature and scope, construction may recommence after the Executive Director informs the permittee of that determination.

(2)If the Executive Director approves the Supplementary Archaeological Plan but determines that the changes therein are not de minimis, construction may not recommence until after the Commission approves an amendment to this permit.

E. At the completion of implementation of the archaeological grading monitoring and mitigation plan, the applicant shall prepare a report, subject to the review and approval of the Executive Director, which shall include but not be limited to, detailed information concerning the quantity, types, location, and detailed description of any cultural resources discovered on the project site, analysis performed and results and the treatment and disposition of any cultural resources that were excavated. The report shall be prepared consistent with the State of California Office of Historic Preservation Planning Bulletin #4, "Archaeological Resource Management Reports (ARMR): Recommended Contents and Format". The final report shall be disseminated to the Executive Director and the South Central Coastal Information Center at California State University at Fullerton.

F. The permittee shall undertake development in conformance with the approved plans unless the Commission amends this permit or the Executive Director determines that no amendment is legally required for any proposed minor deviations.

14. After Special Condition 20, add a new Special Condition 21, Western Snowy Plover Avoidance Plan, as follows:

21. Western Snowy Plover Avoidance Plan

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit a Western Snowy Plover Avoidance Plan prepared by a qualified environmental resources specialist in coordination with the U.S. Fish and Wildlife Service. At a minimum, the plan shall include the following:

(a) All areas to be used for staging and beach construction activities shall be identified and surveyed for the presence of western snowy plover prior to construction.

(b) Descriptions of any potential considerations or specific measures that may be proposed to avoid incidental take.

(c) If snowy plovers are present, in any capacity (i.e. nesting, breeding, or otherwise), the applicant will coordinate with the US Fish and Wildlife Service to ensure avoidance of impacts.

The permittee shall undertake development in conformance with the approved final plan unless the Commission amends this permit or the Executive Director provides a written determination that no amendment is legally required for any proposed minor deviations.

15. On page 33 of the staff report, the last sentence shall be modified as follows:

However, the recommended special conditions for the subject project do require identification of, and adherence to, performance standards to measure the success of the restoration project. Achieving target acreages within 10% of those specified in the EIR remain an objective of this project. Moreover, the post-restoration lagoon should show marked improvement in conditions when compared to the pre-construction condition, with similarities to nearby reference sites as applicable, and as specified in **Special Condition No. 1**, the Habitat Monitoring and Mitigation Plan, (HMMP).

16. On page 38 of the staff report, the first paragraph shall be modified as follows:

San Elijo Lagoon is located within the San Elijo Ecological Reserve (Reserve) in the southernmost part of the City of Encinitas in San Diego County. Approximately 960 acres of the 979-acre Reserve is proposed to be restored. The lagoon is bordered by the City of Solana Beach to the south, Manchester Avenue (City of Encinitas) to the north, Rancho Santa Fe (San Diego County) to the east, and Coast Highway 101 and the Pacific Ocean to the west (Exhibit 1). Land ownership and management of the Reserve is split among the California Department of Fish and Wildlife, County of San Diego Parks and Recreation Department, and the San Elijo Lagoon Conservancy.

17. On page 43 of the staff report, the last paragraph shall be modified as follows:

> Section 30233 requires that adequate mitigation measures to minimize adverse environmental impacts of the project be provided. The applicant has incorporated numerous mitigation measures in the proposal, as required by the Final Environmental Impact Report (FEIR) including the proposed restoration plan described above. **Special Condition No. 1** requires additional monitoring and reporting to determine the success of the restoration efforts relative to reference sites, as applicable, and to pre-construction conditions with regard to ~~on~~ lagoon physical hydrology, revegetation, aquatic, and terrestrial species and requires corrective action if results indicate that the lagoon is not functioning as expected and success criteria are not met. Failure to meet performance standards as outlined in the Habitat Mitigation and Monitoring Plan is expected to trigger adaptive management via collaboration among the applicant and resource agencies. Additional special conditions require BMPs to prevent erosion or the introduction of pollutants into the lagoon during construction. Therefore, the Commission finds that, as conditioned, the project will provide adequate mitigation measures to minimize adverse impacts on habitat values and no net loss of wetland area or function will occur as a result, as required by Section 30233(c).

18. On page 55 of the staff report, the second, third, and fourth bullets shall be modified as follows:

- Water quality variables, including, at a minimum, dissolved oxygen, seasonal percentage of eutrophic conditions, and turbidity, will be evaluated through comparison with reference wetlands, as applicable, or aquatic habitat and relative to baseline conditions.
- The designed tidal prism will be achieved and maintained for all lagoon basins, and tidal flushing will not be interrupted during all time periods in which the tidal inlet is open.
- Within five years of restoration, community composition and the total densities and number of species of fish, macroinvertebrates and birds will be similar to that in similar habitats in the reference wetlands, as applicable, and will indicate improvement relative to pre-restoration conditions.

19. On page 64 of the staff report, the third paragraph shall be modified as follows:

> The western snowy plover (*Charadrius nivosus nivosus*), federally-listed as threatened, is known to nest at Batiquitos and San Elijo lagoons, forage along the shoreline including at Cardiff State Beach and Fletcher Cove, and overwinter on a section of Cardiff State Beach near Highway 101 north of the Seaside parking lot. **Special Condition No. 21** requires the applicant to prepare a Western Snowy Plover Avoidance Plan in coordination with the U.S. Fish and Wildlife Service that includes a description of the considerations and specific measures that may be employed to avoid incidental take, should plovers be present immediately prior to or during construction. To avoid impacts to western snowy plovers during beach construction activities, **Special Condition No. 4** requires that the

applicant survey Cardiff State Beach and Fletcher Cove prior to any beach construction activities. If any western snowy plover are found during the survey, Special Condition No. 21 ~~4~~ requires that the applicant coordinate with U.S. Fish and Wildlife Service to avoid any impacts to the plovers.

20. On page 64 of the staff report, the last sentence shall be modified as follows:

Despite a lack of information from California, the ecological impacts of beach replenishment on beach organisms are considered potentially severe, ~~often~~ resulting in as much as 100% mortality following ecosystem burial from the initial sand placement, and often demonstrating lasting effects that extend up the food web, even to shorebirds, through time.

21. On page 66 of the staff report, the last sentence shall be modified as follows:

Special Condition No. ~~5~~4 addresses the heightened potential for turbidity impacts in the marine environment through inclusion of monitoring requirements to define the extent and persistence of turbidity plumes throughout each day of beach construction.

22. On page 67 of the staff report, the last paragraph shall be modified as follows:

A primary concern regarding the proposed reuse of dredged materials for beach replenishment is the potential for indirect adverse impacts, such as burial and scour of the rocky intertidal and subtidal rocky reef ecosystems in the immediate vicinity of the receiver beaches. Very few peer-reviewed studies have been conducted on nearshore algal and invertebrate species' tolerance to sand burial. The few that have been published suggest that many species are highly sensitive to the influence of sand inundation and therefore, susceptible to lethal and sub-lethal impacts that may be imposed by the project. Research on the effect of sediment burial on surfgrass (*Phyllospadix scouleri*) showed that short-term (15-day) burial results in shoot mortality, decreased shoot counts, and reduced growth.[23] A species that is often found in areas characterized by seasonal sand inundation is the aggregating anemone, *Anthopleura elegantissima.* Though aggregating anemones have been observed to resist shallow sand burial by extending their body columns so that the oral disc and tentacles reach the surface,[24] it has also been suggested that their survival when deeply buried (for three months or more) is due to body tissue

[23] Craig, C., S.Wyllie-Echeverria, E. Carrington & D. Shafer. 2008. Short-Term Sediment Burial EffecsEffects on the Seagrass *Phyllospadix scouleri*. EMRRP Technical Notes Collection (ERDC TN-EMRRP-EI-03). Vicksburg, MS: U.S. Army Engineer Research and Development Center.

[24] O'Brian, P.Y. and M.M. Littler. 1977. Biological Features of Rocky Intertidal Communities at Coal Oil Point, Santa Barbara County, California. In: Littler M.M. (ed.) Spatial and Temporal Variations in the Distribution and Abundance of Rocky Intertidal and Tidepool Biotas in the Southern California Bight. Bureau of Land Management, U.S. Department of the Interior, Washington, D.C. pp.317-405.

metabolism and thus, there is a physiological cost and compromise in productivity.[25] Therefore, **Special Condition No. 5** requires five (5) years of rocky intertidal and subtidal rocky reef ecosystem monitoring, to be able to evaluate the project's impacts on these sensitive marine habitats and their communities. To ensure that biologically-meaningful effects are captured in the monitoring, Special Condition No. 5 further requires that intertidal and subtidal field sampling methods employed be capable of characterizing finer-scale physical structures (e.g., substrate relief and rugosity, available crevices and vertical surfaces, sand cover, and habitat-forming species such as kelp and surfgrass) and the biological communities (e.g., number and abundances of algal and invertebrate species, invasive species, recruitment, guild) of the sandy beach, rocky intertidal, and subtidal rocky reef ecosystems, and that the methods be designed to ~~discover~~ detect, at a minimum, a 20% effect size ~~change~~ between ~~respective~~ the impact and reference sites, with >80% statistical power[26]. The assessment approach should be similar to that used for SONGS[27] for evaluating adverse impacts.[28] Special Condition No. 5 also specifies that while it shall be assumed that any statistically significant adverse impact that is detected is a result of the project, the applicant has the opportunity to provide compelling evidence to the contrary, allowing for consideration of localized catastrophic events (e.g., wastewater spills or development of sea urchin barrens) that may alternatively drive any changes observed.

23. On page 69 of the staff report, the last paragraph shall be modified as follows:

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[25] Sebens, K.P. 1980. The Regulation of Asexual Reproduction and Indeterminate Body Size in the Sea Anemone *Anthopleura elegantissima* (Brandt). Biological Bulletin Marine Biological Lab, Woods Hole, V. 158:370-382.

[26] That is, the sampling shall be designed to have an 80% chance of picking up a 20% change. This is sometimes referred to as the 20-20-20 rule where Type I error (the null hypothesis is true but rejected) - or α - is set at 0.20, Type II error (the null hypothesis is false but accepted) - or β - is set at 0.20, and power is equal to 1-β, or 0.80. In other words, the plan shall specify biologically-meaningful effect sizes (*i.e.*, a difference between the reference sites and the impact sites) and specify α and β, with α = β. The field sampling plan shall include sufficient replication to provide a statistical test with at least 80% statistical power (β = 0.20) to detect an effect of the stated size with α = 0.20.

[27] Ambrose, R., M. Page, P. Raimondi, D. Reed, R. Schmitt, and S. Schroeter. 2007. The Definition of Compliance and the Determination of Similarity in the Context of the SONGS Mitigation Projects. White paper prepared for the Staff of the California Coastal Commission. March 2007.

[28] Such an approach allows for a floating α, providing reasonable flexibility to ensure fairness to both the State and the applicant. It protects the State from a determination that no adverse impacts have occurred when the sampling conducted proves to have been insufficient and at the same time, it gives confidence in a determination when the monitoring has been statistically-robust. In the event that an effect size is large and the confidence in results is weak, it treats these results as inconclusive and sets forth a methodology for further interpretations. Mathematically, this can be expressed as where α is between 0.000-0.500, and α < effect size it would be concluded that the respective detection criteria is unmet and therefore out of compliance, and when α > effect size, the respective criteria is met and would be considered in compliance. Where α > 0.500 and effect size > 0.500, compliance with the respective criteria would be considered inconclusive and require further examination.

Previous monitoring programs associated with permitted replenishment projects have focused on gross-scale changes to either physical structure defining the extent of habitat(s), and/or changes in broad functional groups of biological communities. However, such coarse-scale approaches have failed to capture the importance of physical features such as the space between reef substrate where species such as lobster or abalone reside, as well as shifts in the composition of biological communities and the ecosystem functions or services they provide for. For example, anecdotal information suggests that previous replenishment projects have affected commercially-important lobster populations. If beach replenishment projects are indeed affecting such resources, it is ~~would be~~ important to understand this and promote that replenishment methods be conducted in such a way that they can be sufficiently protective of sensitive marine resources and yet achieve shoreline protection and public access goals. To inform our understanding of potential beach replenishment impacts on sensitive marine resources, **Special Condition No. 5** specifically includes objectives requiring the quantitative characterization of biological communities that may be impacted.

Another important shortcoming in previous replenishment projects, which has been recognized in hindsight, has been the lack of statistical rigor in monitoring programs. In the absence of such rigor, the ability to assess potential impacts, adaptively manage, and require mitigation for them has been severely limited due to inconclusive results. Much of this may have been avoided had the monitoring programs been adequately designed to have sufficient statistical power and thus, an ability to fairly assess project impacts. For this reason, **Special Condition No. 5** specifically includes requirements for the monitoring design, criteria to detect adverse impacts, and methods to quantitatively assess adverse impacts to sandy beach, rocky intertidal, and subtidal rocky reef ecosystems.

Finally, **Special Condition No. 5** requires that any adverse impacts to sandy beach, rocky intertidal, and subtidal rocky reefs must be addressed through adaptive management, and if the latter would prove insufficient, mitigated for by the applicant through the creation or enhancement of marine ecosystems of the same type, where such in-kind mitigation is feasible for the ecosystem in question. Where in-kind ecosystems cannot be created, creation of other types may be proposed by the applicant for the review the Executive Director. Though adaptive management is preferred when feasible, mitigation for adverse impacts to marine ecosystems may be required, and if so, it will be determined at the time that adverse impacts are identified. If the Executive Director determines that compensatory mitigation becomes necessary for any of the respective ecosystems, the applicant will be required to develop an ecosystem-specific mitigation plan for each, which will provide the overall framework to guide the mitigation work, for review and approval of the Executive Director. The revised mitigation and monitoring program must be reviewed by the Commission as an amendment to the coastal development permit.

24. On page 76 of the staff report, the fourth paragraph shall be modified as follows:

> Public access improvements included in adjacent infrastructure projects within the lagoon will further enhance connectivity within the lagoon system and to the coast. A pedestrian undercrossing will be constructed as a part of the railroad improvements that will facilitate a safe crossing for trail users to the coast, and the new bike and pedestrian bridge scheduled for construction under the new I-5 bridge will allow for improved north-south connectivity. In addition, a new park-and-ride facility will be constructed just east of I-5 on the north side of Manchester Avenue that will include dedicated parking spaces for lagoon visitors. These improvements, along with a new trail connection to the Lagoon Conservancy center and improved parking facilities will result in a more robust and integrated trail system within the lagoon.

25. On page 77 of the staff report, the last paragraph shall be modified as follows:

> It is difficult to estimate precisely how long the fill sand will remain on receiver beaches; however, the Environmental Impact Report for the project estimates that it would take from three to five or more years for the receiver beaches to return to their pre-project condition. During that time, the public will have the benefit of wider sandy beaches. The applicant proposes shoreline monitoring for five years following construction. The proposed monitoring would be similar to the Regional Shoreline Monitoring Program initiated by SANDAG in 1996, which measures the beach width over time at beaches in San Diego County, including Cardiff State Beach and Fletcher Cove. Using a similar methodology in this case would allow the data collected following the proposed project to be compared to the historic results collected through SANDAG's Regional Shoreline Monitoring Program. **Special Condition No. 8** requires a final Shoreline Monitoring Plan to be submitted for Executive Director review and approval. In addition, based on the density of the proposed nourishment project on Cardiff State Beach and in line with past Commission actions, Special Condition No. 8 requires that the applicant conduct four monitoring transects at Cardiff State Beach to ensure that sufficient information is gathered on the utility and efficacy of the beneficial reuse. **Special Condition No. 8** further requires that the applicant submit monitoring results to the Commission annually.

26. On page 79 of the staff report, the last sentence shall be modified as follows:

> Therefore, as conditioned, the proposed project is consistent with the public access and recreation policies of the Coastal Act~~.~~, as well as the applicable policies from the City of Encinitas's LCP.

27. On Page 79 of the staff report, the third and fourth paragraphs shall be modified as follows:

The applicant conducted a Surfing Study, which examined the surfing resources of the project area and the potential impacts on surfing from beach nourishment. A total of 10 sites were studied, including Swamis, Pipes, Turtles, Cardiff Reef (South Peak, Suck Outs), Georges, Seaside (Parking Lots and Palisades, Seaside Reef), Pillbox, and Cherry Hill. These sites were chosen because of their frequency of use, value to the local surfing community, distance from the lagoon inlet, and quality of ride at the break. The study established baseline conditions at each surf site by monitoring individual sites twice a week for six months to collect data including local wind speed, wind direction, tide data, and beach/user counts. Each site was also rated based on wave quality and size. Once baseline conditions were established at each site, the applicant conducted a quantitative analysis of potential project induced changes for several parameters (wave backwash, wave breaking intensity, reef burial, wave breaker location, peel angle, ride length, surfer type and wave breaking frequency) as well as a qualitative analysis which relied on anecdotal evidence and interviews with locals. At Cardiff, the study analyzed the placement of 300,000 cubic yards of sand on-shore and 300,000 cubic yards of sand near-shore, an amount significantly larger than what is now proposed, and found that although there would be temporary impacts, long-term reef and sandbar conditions would remain as least as good as existing conditions. Wave backwash, which can affect wave quality, would be similar to existing conditions within six months. At the recommendation of staff, the applicant has revised the project to place only the 300,000 cubic yards of sand on-shore at Cardiff, and, thus, the temporary impacts to surfing would be significantly less than those analyzed as a part of the original project, which included a total of 600,000 cubic yards onshore and near-shore at Cardiff. At Solana Beach the study found similar effects of temporary changes and no long-term adverse effects. The study also notes that in the case of Solana Beach, monitoring for RBSP in 2001 (after placing the same amount of sand proposed for the subject project) found that surfing at nearby sites improved for a short time and then reverted to pre-project conditions.

Increased flows at the lagoon mouth resulting from the proposed project could also affect nearby surfing. The Surf Study found that increased currents would not affect Cardiff Reef or other adjacent surf spots, but recommended that monitoring of surfing and currents at Cardiff Reef should occur to quantify adverse impacts and identify potential mitigation measures. **Special Condition No. 9** requires the applicant to monitor the surf zone prior to ~~commencement of nourishment activities~~, during, and ~~immediately~~ six months following nourishment activities using the same quantitative and qualitative methods used to establish baseline conditions in the surfing study and to submit a monitoring report to the Commission. Should the results of the monitoring indicate that impacts to surfing resources are occurring at the end of the six month monitoring period, Special Condition No. 9 requires that the applicant continue monitoring for an additional six months.

28. On page 83 of the staff report, the second paragraph shall be modified as follows:

Thirty archeological sites have been recorded within 300 feet of the project area, and 108 cultural resource investigations have been carried out within a one-mile radius of the site.

As a part of the certified EIR for the San Elijo Lagoon Restoration Project, a Cultural Resources Technical Report was prepared. Evaluation of eight archaeological sites were conducted at previously recorded sites that appeared to be within or adjacent to the project activities that could potentially impact these resources. The study found that none of the previously recorded sites are within or adjacent to the proposed limits of disturbance; however, one new site (CA-SDI-20,816) was recorded and is bisected by an existing access road that is proposed to be used during construction; however, no grading would occur within the limits of the archaeological site. ~~Within the proposed project area, only one site, has been identified to contain known cultural resources.~~ To protect the site from accidental disturbance, the project includes mitigation measures that prohibit grading in proximity to the site, limit construction equipment and vehicles to staked limits of disturbance, and require exclusionary fencing to be used in proximity to the site. ~~**Special Condition No. 20** further requires that there be a qualified archaeologist and appropriate Native American consultant present on-site during all grading and vegetation clearance activities that occur within or adjacent to the recorded archaeological site in the project area. Therefore, the Commission finds that the proposed project, as conditioned, is consistent with Section 30244 of the Coastal Act.~~

In addition, the applicant's archaeologist reviewed borings and sediment characterization completed for the project design. The review confirmed only alluvial/colluvial material with low potential for cultural resources would be disturbed within the lagoon through project implementation.

During the EIR process, the Native American Heritage Commission was contacted for a list of interested tribes and persons. A contact program consisting of an information letter, map, and response form was sent to each of the following tribes: Barona Group of the Capitan Grande, Inaja Band of Mission Indians, Ipai Nation of Santa Ysabel, Jamul Indian Village, Kumeyaay, Kwaaymii Laguna Band of Mission Indians, La Posta Band of Mission Indians, Los Coyotes Band of Mission Indians, Manzanita Band of Kumeyaay Nation, Mesa Grande Band of Mission Indians, Pauma Valley Band of Luiseño Indians, San Luis Rey Band of Mission Indians, San Pasqual Band of Indians, San Pasqual Band of Mission Indians, Sycuan Band of the Kumeyaay Nation, and Viejas Band of Kumeyaay Indians. Two responses were received with requests that a monitor from the Kumeyaay Nation and the San Pasqual Band of Indians be present during project work.

Therefore, **Special Condition No. 20** is required to provide monitoring and mitigation for the potential adverse impacts of the proposed project on archaeological and paleontological resources. This condition would require the development and implementation of an archaeological monitoring and mitigation plan for the protection of

archaeological/cultural resources during project grading and construction activities. With implementation of **Special Condition No. 20**, the proposed project would avoid known archaeological resource areas and include reasonable mitigation measures to address potential adverse impacts to archaeological or paleontological resources. Therefore, the Commission finds that the proposed project, as conditioned, is consistent with Section 30244 of the Coastal Act.

29. On page 83 of the staff report, the first sentence of the last paragraph shall be modified as follows:

The County of San Diego, acting as lead agency, prepared an Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), and subsequently certified the Final EIR/EIS on February 26, 2016.

County of San Diego

BRIAN ALBRIGHT
DIRECTOR
(858) 966-1301

DEPARTMENT OF PARKS AND RECREATION
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Administrative Office (858) 694-3030
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December 2, 2016

Agenda Item: W14b
Application No: 6-16-0275
Brian Albright, Director
IN FAVOR

Delivered via email

To: Melody Lasiter
California Coastal Commission
7575 Metropolitan Drive Ste. 103
San Diego, CA 92108-4402

Dear Commissioners,

The County of San Diego Department of Parks and Recreation (County Parks) would like to express support for the Coastal Development Permit to implement the San Elijo Lagoon Restoration Project (SELRP). The SELRP is an important project that balances the biological and hydrological aspects of the lagoon with public recreational access.

The County of San Diego (County) owns 567 acres of the 977-acre San Elijo Lagoon Ecological Reserve (Reserve). Under an agreement with the California Department of Fish and Wildlife and the San Elijo Lagoon Conservancy (SELC), County Parks operates and manages the entirety of the Reserve, including the San Elijo Lagoon Nature Center, which the County constructed and opened to the public in 2009. We take tremendous pride in providing high quality nature-based recreational experiences to the residents and visitors of San Diego County. The County has a lot invested in this project, not just as an owner/manager of the Reserve, but as the CEQA Lead Agency; we will assist in any way we can to ensure a successful project.

The San Elijo Lagoon is a unique coastal environment consisting of a mosaic of habitats that support many sensitive plants and animals, including threatened and endangered species. County Parks concurs with Coastal Commission staff that taking an ecosystem-based approach instead of a single species approach is critical to restore and enhance the lagoon's physical and biological functions. We are generally supportive of the recommendations in the Staff Report, but we would like to provide comments on the following aspects of the Staff Report.

Recreational Resources

We are concerned that placement of 300,000 cubic yards of sand proposed at Cardiff State Beach may have an adverse impact on surfing is this area, particularly Cardiff Reef and Seaside Reef, two regionally significant surf breaks that are recognized by experienced surfers worldwide. The beach nourishment proposed should occur in conjunction with the Cardiff State Beach Living Shoreline project, along with adequate monitoring to ensure on-going protection of the recreational and unique ecological resources.

We are concerned that the surf monitoring proposed in Special Condition 9 is insufficient. Due to the potential for impacts to the local surf breaks, County Parks requests that the pre- and post-construction monitoring duration be extended in order to gather adequate data. Pre-construction monitoring should commence as soon as possible to establish the longest feasible baseline. Natural surf conditions vary seasonally, hence we request that post-placement surf monitoring be conducted for at least a year to include all seasons and extended longer if significant impacts are identified. Additionally, we request that Seaside Reef be added to the surf monitoring locations.

Public Access and Trail Signage Plans

Special Conditions 3 and 15 require the applicant (Caltrans/SELC) to submit a trail signage plan and public access management plan for review and approval of the Executive Director. Per County of San Diego Ordinance, all management plans for County parkland must be approved by the County Parks Director to ensure consistency with County park and preserve standards. Therefore, we request that Special Conditions 3 and 15 be revised to require that both the trail signage plan and public access management program be approved first by the County of San Diego prior to submittal to the Executive Director and any subsequent changes to either plan are also approved first by the County of San Diego prior to submittal to the Executive Director.

The County of San Diego appreciates the opportunity to provide support and comments to the Commission on this very important project. We look forward to assisting Caltrans and the construction management team to ensure a successful outcome to this very worthwhile project.

Respectfully,

BRIAN ALBRIGHT
Director

Cc: Kanani Brown, Coastal Program Analyst, CA Coastal Commission
Kim Smith, Chief, Environmental Stewardship and Ecological Studies, Caltrans District 11
Doug Gibson, Executive Director, San Elijo Lagoon Conservancy

Surfrider Foundation San Diego County Chapter

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San Diego, CA 92121
Phone: (858) 622-9661 Fax: (858) 622-9961

December 2, 2016

Delivered via email

To: M. Lasiter
California Coastal Commission
7575 Metropolitan Drive Ste 103
San Diego, CA 92108-4402

Re: Item W14b-12-2016, Staff Report on San Elijo Lagoon Restoration, CDP 6-16-0275

Dear Coastal Commissioners and Staff,

Surfrider Foundation San Diego Chapter is happy to have been a stakeholder in this project since the initial scoping. We appreciate the value placed on surfing resources throughout the planning, and we hope this can be a model for other coastal projects moving forward. We support the overall goal for the restoration and believe, if successful, the project will be a great benefit to San Diego's unique coastal environment.

We are generally supportive of the recommendations made in the Staff Report concerning the San Elijo Lagoon Restoration project. We are specifically commenting on the following aspects of the staff report:

- Quantities and locations of material placement at beaches and off-shore borrow sites
- Special condition 9: Surf monitoring to minimize and quantify impacts to surfing resources

We support the quantities and locations concerning material placement at beaches and off-shore borrow sites with one caveat (p 58).

> *"Restoration of San Elijo Lagoon will generate approximately 850,000 cubic yards of excess sediment through creation of an overdredge pit in the central basin…Sand excavated from the overdredge pit is proposed to be placed in four different locations just outside of San Elijo Lagoon, into the environment it would have been expected to reach had humans not manipulated this coastal system."*
>
> *"Following are the sand quantities proposed for each placement site:*
> - *Cardiff State Beach – 300,000 cubic yards (cy)*
> - *Fletcher Cove – 146,000 cy*
> - *SO-6 RBSP I (2001) – 107,000 cy*
> - *SO-6 RBSP II (2012) – 297,000 cy"*

The 300,000 cy of sand proposed for Cardiff State Beach is more than 3 times the amount of sediment that was placed as part of RBSP II. Placing an excess of sand on this beach may have unintended consequences,

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especially given the issues faced in Imperial Beach during the RBSP II project. Oversized beach fill on Imperial Beach resulted in the waves overtopping the high sandy shelf causing serious flooding for homeowners, dangerous beach conditions for beachgoers, and a very negative impact on surfing resources. We feel that the 300,000 cy of sand should only be placed if the Cardiff State Beach Living Shoreline project moves forward in conjunction with the SELRP. One goal of the project is to construct artificial dunes to protect Highway 101, which would be a great use for the excess of sand to be placed at Cardiff State Beach. If the two projects are not coordinated in terms of sand placement on the beach, the amount of sand placed on the beach should be reduced, and more sand should be diverted to the offshore receiver site SO-6. If there is not sufficient capacity in SO-6 to accept this additional sand, it should not be placed on Cardiff State Beach, but be diverted to another location. Additionally, any excess sand should not be placed in a nearshore mound off of Cardiff, as the addition of sand both the beach and a nearshore mound would result in far too much sand in this area, threatening important ecological, recreational, and surfing resources.

We applaud the inclusion of surf monitoring as a condition of approval. That being said, the surf monitoring program needs to be significantly strengthened as this is such a large project with potentially long-lasting impacts (p 24).

> *"PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director, for review and written approval, a Surf Monitoring Plan to visually monitor surfing conditions at and adjacent to Cardiff State Beach and Fletcher Cove before and after sand placement...and shall include, at a minimum, the following:*
>
> *(a) Identify the major surfing breaks at and adjacent to Cardiff State Beach and Fletcher Cove and determine appropriate monitoring sites;*
>
> *(b) Document morning conditions on video and/or using a standardized data sheet, as follows:*
>
> *i. Pre-construction monitoring shall begin two weeks prior to sand placement, and take place 3 times per week over 14 days; and*
>
> *ii. Post-construction monitoring shall begin within two weeks following completion of sand placement, and take place 3 times per week over 30 days.*
>
> *(c) Surf monitoring shall include estimates of wave height, type of wave (hollow or mushy), breaker distance from shore, length of peel, and existence of backwash;*
>
> *(d) Conduct standardized interviews with surfers using a questionnaire;*
>
> *(e) Estimate the density of surfers at each site surfing site during monitoring; and*
>
> *(f) A final report that includes the monitoring results and an analysis of any change in surfing conditions shall be submitted to the Executive Director within 90 days of the final survey."*

Overall we feel the surf spot monitoring proposed by the Commission in Special condition 9 is lacking when compared to recent surf spot monitoring efforts conducted by Surfrider for Regional Beach Sand Project (RBSP) II and proposed for US Army Corps of Engineers (USACOE) project in San Clemente designed by

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USACOE engineer Chuck Mesa. For more information on quantifying surfability, see "Surfability, A Proposed Scale for Surfable Waves", Mesa, C. *Coastal Engineering Practice* **2011** (attached). Likewise Timbo Stillinger of the San Elijo Lagoon Conservancy completed a 6-month surf monitoring study for the San Elijo Lagoon Conservancy in 2011 (referred to as "Surfing Monitoring Program Overview" in the staff report), which outlined robust methodology for conducting such a study. Additionally, Surfline has cameras focused on many of the surf spots within the project limits. We strongly suggest that the applicant work with USACOE and/or Surfline to bring state of the art surf spot monitoring to this project.

The pre- and post-construction duration of surf monitoring needs to be significantly lengthened in order to gather sufficient data to make any findings. Two weeks is not sufficient time to gather baseline surfing information to establish pre-project conditions. We suggest that the surf spot monitoring commence immediately after project approval and would need to last at least a year to cover all seasons and conditions. This will allow for collection of a more meaningful baseline. A detraction to the Surf Spot monitoring we conducted during RBSP II, was the lack of a meaningful baseline. Likewise, four weeks is not sufficient time to gather information to establish post-project conditions. The Surfrider led monitoring for RBSP II collected data 2 years after project completion. Given the seasonality of wind speed, storm events, and swell direction, it is unlikely a 4-week period will fully measure if there were any impacts to surfing from the large amount of sand placed. The "Surfability, A Proposed Scale for Surfable Waves", Mesa, C. *Coastal Engineering Practice* **2011**" study also recommends a 24-month study period. Furthermore, the other monitoring requirements for this project typically span five years, which we applaud. We believe that surfing is an equally valuable resource that must be monitored sufficiently.

As part of the surf monitoring studies, Seaside Reef needs to be included as a monitored location (in addition to Fletcher Cove, Georges and Cardiff State Beach) for changes to surf, especially due to the predominantly southward drift of sand. The survey portion of the "Surfing Monitoring Program Overview" should also address how surfing conditions have changed at any or all of these sites.

Thank you for the considering our comments to this project.
Sincerely,

Julia Chunn-Heer
Policy Manager, San Diego County Chapter of the Surfrider Foundation

Tom Cook
Beach Preservation Committee Member, San Diego County Chapter of the Surfrider Foundation

Kristin Brinner
Co-chair of the Beach Preservation Committee Member, San Diego County Chapter of the Surfrider Foundation

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The Surfrider Foundation is a grassroots non-profit environmental organization dedicated to the protection and enjoyment of the world's oceans, waves and beaches through a powerful activist network. Founded in 1984 by a handful of visionary surfers in Malibu, California, the Surfrider Foundation now maintains over 250,000 supporters, activists and members worldwide. For an overview of the Surfrider Foundation San Diego Chapter's current campaigns, programs and initiatives visit www.surfridersd.org or contact info@surfridersd.org or (858) 622-9661.

SURFABILITY: A PROPOSED SCALE FOR SURFABLE WAVES

Chuck Mesa

U.S. Army Corps of Engineers, Los Angeles District, 915 Wilshire Blvd, Los Angeles, CA, 90017-3401, United States; 213-452-3678; chuck.mesa@usace.army.mil

ABSTRACT

This paper describes a proposed scale for surfability and is field tested with 24 months of visual observations at Imperial Beach, California, USA. At present there is no generally accepted method to classify "surfability", or surf quality, of surfable waves. In this paper surfability is defined by a ten point scale ranging from extremely poor to excellent. Each point on the scale includes a subjective quality rating and an objective percentage representing increasingly higher quality rideable surfing waves. Oceanographic characteristics (height, period, direction, tide, sea surface condition) were simultaneously recorded for cross-comparisons with the surfability rating. Joint distributions delineate which conditions are most conducive to high surfability. Human nature introduces some influences on the visual observations.

INTRODUCTION

High quality surfable waves are an increasingly valuable resource worldwide. Quantitative information of the nearshore surfing climatology is of vital importance to the field of coastal zone management. Coastal engineers and scientists, government, civic planners, and the general public require accurate characterization of the site specific surfing conditions for rational decision making in the coastal zone. Through increasingly widespread dissemination, this information is also vital to promote the responsible use and enjoyment of coastal resources by recreational surfers and all marine enthusiasts.

At present there is no generally accepted method to classify surfable waves. "Surfability", or surf quality, is often expressed by the surfing community in descriptive non-technical terms. These expressions include but are not limited to "hollow", "sick", "barrel", "gnarly", "slab", "soup", and "mush". To experienced surfers, these descriptions convey a vocabulary of surfability, and surfers are able to envision the surfability of waves based on these descriptions. These expressions, however, are of little value to the scientific community. The descriptive based

language of surfing is disconnected from the quantitative based language of the scientific community.

The desire to systematically classify surfability, and thereby bridge the languages of the surfing and scientific communities, established the framework for this study. If surfability can be systematically classified, then surfing conditions at any location can be measured for general condition assessment, or as a method to assess impacts from anthropogenic actions within the coastal zone. However, surfability and surf quality is highly subjective and not easily measured by conventional electronic field data collection methods, i.e. bottom mounted pressure sensors, surface riding buoys, etc. This study employs visual observations which have not traditionally been used as a source of engineering accurate wave climatology information. Visual observations have some human induced influences, but are simple to conduct and are very cost effective relative to other electronic means of field data collection.

This paper describes the results of a field data collection program of visual observations at Imperial Beach, California, USA. Surf zone measurements were obtained by highly trained visual observers. The data was compiled to investigate the efficacy of the surfability concept. It is believed that this represents the first attempt to systematically obtain measured data for the expressed intent to classify surfability

VISUAL OBSERVATIONS

Visual observations of the surf zone conditions at Imperial Beach, California were obtained by Surfline, Inc of Huntington Beach, California. Surfline employs a network of trained personnel who visually estimate and report wave climate twice daily at the shore in a variety of locations along the California coast. The wave climate observations are forwarded to a central office where they are collected and made available to the public through a subscription service.

The wave climate was developed from data collected for a 24 month period from May2009 – Apr2011. A trained observer visually estimated the breaking wave climate at the shoreline twice daily, typically at 0600 (first light) and at 1300; the times were approximate. Waves were observed for a period of 5-10 minutes and physical characteristics measured included surf quality, wave height, wave period, wave direction, sea surface condition, and crowd counts. There were 1,459 measurements over the observation period. Specific details of the observation methodology include:

a. Surfability is a combination subjective/objective rating by the trained observer (who is also an excellent surfer) and is defined by a ten point scale ranging from extremely poor to excellent. Each point on the scale includes a subjective quality rating and an objective percentage representing increasingly higher quality rideable surfing waves. Classifying rideable waves requires a deep understanding of surfing and those aspects of the surf which result in high quality rideable waves. Surfability was reported according to the following scale:
   1. EXTREMELY POOR: Unsurfable or flat conditions.
   2. POOR: Due to lack of surf, very poor wave shape for surfing; poor surf due to other conditions such as wind, tides, or very stormy conditions.
   3. POOR to FAIR: Poor surf with some (30%) fair waves to ride.

4. POOR to FAIR: Generally poor surf with many (50%) fair waves to ride.
5. FAIR: Very average surf with most (70%) waves rideable.
6. FAIR to GOOD: Fair surf with some (30%) good waves.
7. FAIR to GOOD: Generally fair surf with many (50%) good waves.
8. GOOD**:** Generally good surf with most (70%) good waves.
9. GOOD to EXCELLENT: Very good surf with many (50%) excellent waves.
10. EXCELLENT: Extremely good surf with most (70%) waves being excellent to ride and generally some of the best surf all year.

b. Breaking wave heights (crest to trough) were observed and the minimum, average, and maximum were visually estimated to the nearest 1 ft. Visual wave height observations in the surf zone are typically calibrated based on other surfers in the surf zone. The standing body of a person board surfing provides a quasi fixed frame of reference to obtain estimates. It is usual and customary to estimate wave heights based on the following scale: ankle high = 1 ft; knee high = 2 ft; waist high = 3 ft; chest high = 4 ft; shoulder high = 5 ft; head high = 6 ft. Conditions where no surfers are present are dependent on the skill and experience of the observer to obtain an accurate estimate.
c. Wave period is based on an average of 30 waves over the 5-10 minute observation period and was reported to the nearest 1 second.
d. Wave directions were reported relative to the beach normal and estimated to the nearest 5 degrees. Wave directions were recorded as normal (0-10 degrees); slightly from the left (or right) (10-25 degrees); significantly from the left (or right) (greater than 25 degrees).
e. Sea surface condition is an estimate of the smoothness/roughness of the water surface. Sea surface condition was reported according to the following scale: 1=smooth; 2=light bump; 3=bumpy; 4=light chop; 5=choppy; 6=very choppy.
f. Crowd count is an estimate of in-water usage by surfers. Crowd count was reported using the following scale: 1-low; 2-low-medium; 3-medium; 4-medium high; 5-high.
g. Comments from the observer generalizing the overall description of the surfing conditions and highlighting any significant influence on the surfing conditions by any of the specific wave characteristics such as wind, tide, etc.
h. Video monitoring of the surf zone conditions was recorded twice daily coincident with the wave parameter monitoring visual observations. The video format was JPEG loops for a period of 5 minutes to represent an accurate sampling of the surf conditions during the observational process.

SURFABILITY

The histogram of all surfability observations is shown in Figure 1. The histogram is left skewed, ranges between 1-8, a mode and median of 4, and a mean value of 4.1. The distribution is well rounded about the mode.

The absence of ratings with score 9-10 suggests a bias in the observations. The observations include some ratings with score 1, but no ratings with score 9-10. The scale is designed to evaluate the surfability on an annual basis. By definition, during

the course of one year some excellent surfable waves (score 10) should occur. It is theorized the reasons for this bias are rooted in unfamiliarity with and incomplete application of the scale. A wave with surfability score of 10 may occur at any time on any day. It is theorized that the observer might withhold the higher 9-10 scores while waiting for "perfect" conditions. This may be particularly true during the early stages of the observations. This phenomenon is displayed in various competitive human endeavors which require subjective scoring. It is well known that early scoring suffers compared to later scoring as the judges become more familiar with the action that is being scored. Judges a posteriori recognize what action deserves a 10 score with the benefit of retrospective hindsight. While the surf observer clearly and early recognized which conditions were unsurfable (score 1), judgment was restrained on which conditions were excellent (score 10).

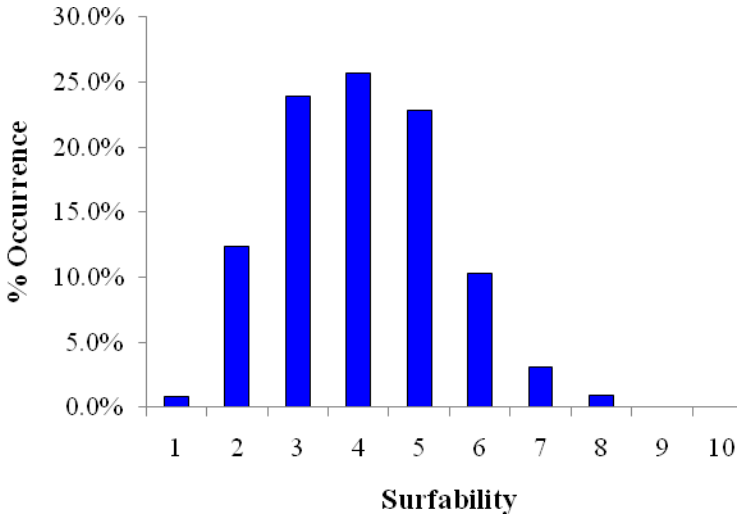

Figure 1 Histogram of Surfability Observations

WAVE HEIGHT

The joint distribution of breaking wave height and surfability is shown in Figure 2. Some general observations can be made regarding the breaking wave height climatology. The observations illustrate a relatively benign wave climate during the 24 month measurement period. The maximum observed wave height is 8 ft which was recorded twice during the 24 month measurement period. The most commonly occurring observed wave height is 2 ft and includes approximately 44% of all observations. This relatively benign wave climate is unexpected given the somewhat severe winter wave climate that can occur in southern California. The highest surfability score occurred with wave heights of 3 ft. Significantly, the highest observed wave heights did not coincide with the highest surfability score. Inspection of the observations indicates the two highest wave height observations coincided with surfability ratings of 3 and 1.

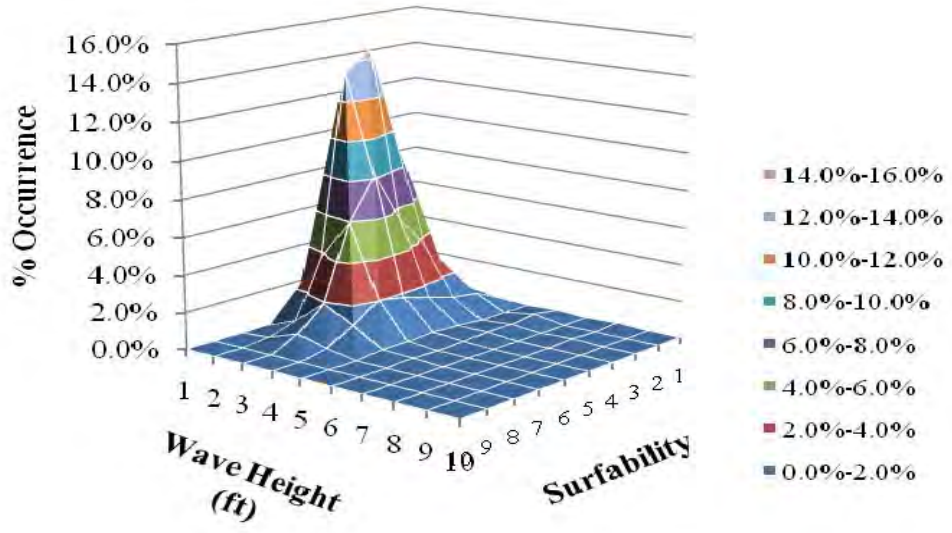

Figure 2 Joint Distribution of Wave Height and Surfability

WAVE PERIOD

The joint distribution of wave period and surfability is shown in Figure 3. There is a very dominant peak at 9 sec (37% of observations) and a secondary peak at 13 sec (3% of observations). The double peaked histogram in this figure illustrates the dual sea/swell nature of the wave climate which is very common in southern California. Shorter period waves are typically associated with sea conditions; longer period waves are typically associated with swell conditions. The cut-off between sea and swell is somewhat subjective but in southern California is generally accepted between 8-10 seconds. The highest surfability score was approximately equally distributed between wave periods 7-12 sec with a slight preference for the 9 sec band coinciding with the dominant wave period.

WAVE DIRECTION

The joint distribution of wave direction and surfability is shown in Figure 4. A majority (44%) of the observations are from shore normal (within 10 deg of normal). The distribution is right skewed with a preponderance (34% versus 19%) for waves arriving from the right (+1) compared to the left (-1). The highest surfability scores very clearly favored the +1 wave direction indicating the west direction. The west direction is most closely associated with the winter season with extratropical storm systems arriving from the west-northwest principal directions.

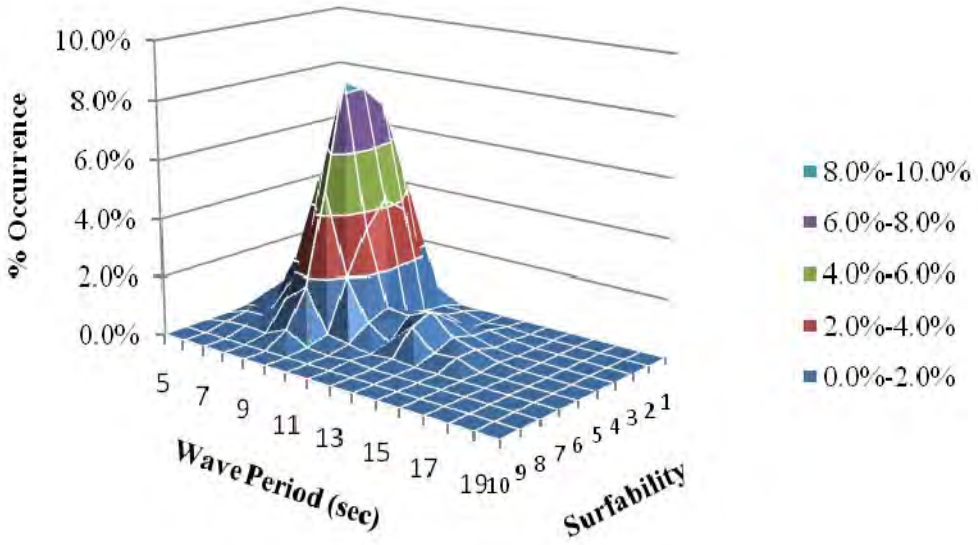

Figure 3 Joint Distribution of Wave Period and Surfability

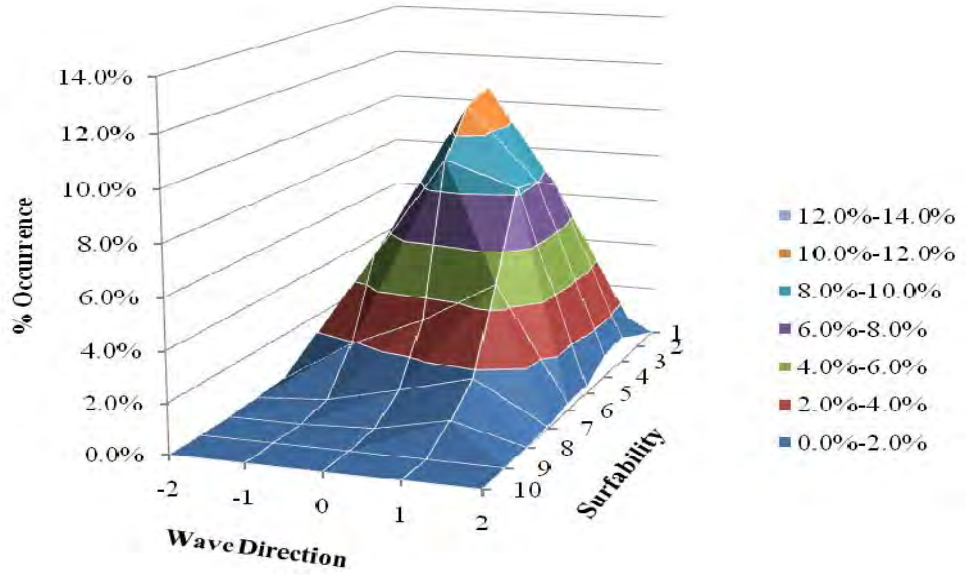

Figure 4 Joint Distribution of Wave Direction and Surfability

TIDE

The joint distribution of tide and surfability is shown in Figure 5. As expected, the distribution is peaked at the mean tidal value (3-4 ft) within the diurnal tidal range (6+ ft). The highest surfability scores are approximately evenly distributed over the tidal range. Although the total number of high surfability scores favors the 4 ft tidal range, the distribution is approximately evenly distributed when adjusted on a

percentage basis. Thus, for tidal values this location indicates no obvious preference for high surfability.

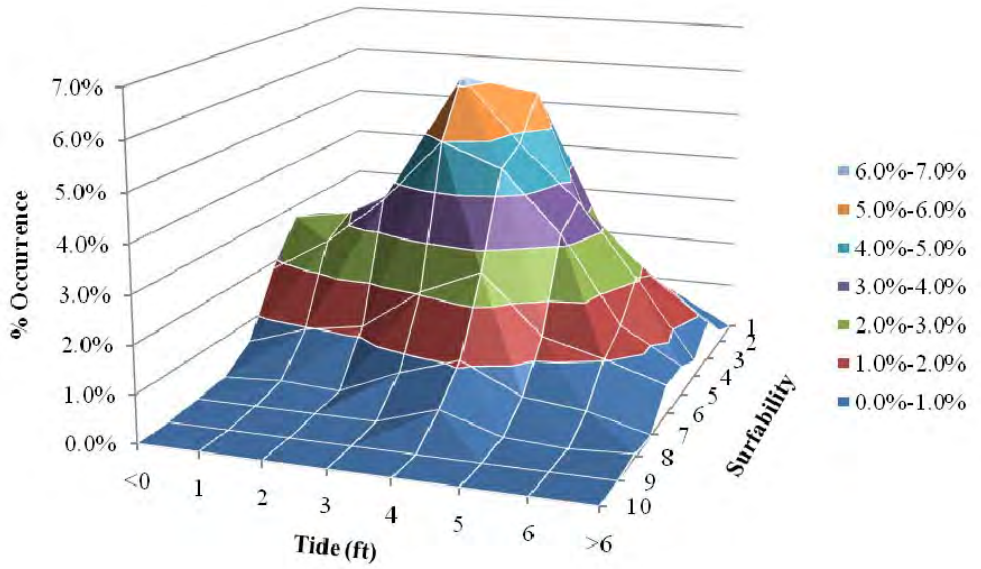

Figure 5 Joint Distribution of Tide and Surfability

SURFACE CONDITION

The joint distribution of surface condition and surfability is shown in Figure 6. The surface condition is significantly left skewed with a significant percentage (79%) of the observations indicating surface condition 1-2. The highest surfability scores very clearly favor surface condition 1, i.e. the calmest surface conditions. The converse is also true; surface condition 6 is clearly associated with the lowest surfability scores. These observations were expected a priori as little or no wind conditions ("glassy" in surfer vocabulary) are the favored surfing conditions; the observations clearly reinforce this statement.

MORNING / AFTERNOON

The measurements indicate a substantial difference between morning and afternoon as shown in Figure 7. All surfability observations were recorded twice daily; typically at 0600 (first light) and at 1300. The results clearly indicate a shift from higher surfability in the morning to lower surfability in the afternoon. The morning histogram has a very pronounced peak at 5 whereas the afternoon peak is 3, indicating degraded surfing conditions. The morning also includes a larger number of observations greater than 6 indicative of more favorable surfing conditions. This result is not unexpected and can be attributed to the wind. In southern California, winds are generally calm and in the offshore direction in the morning while tending to reverse direction to onshore and increase in magnitude steadily thru the afternoon.

Wind magnitude (surface condition) and direction is a substantial contributor to low surfability.

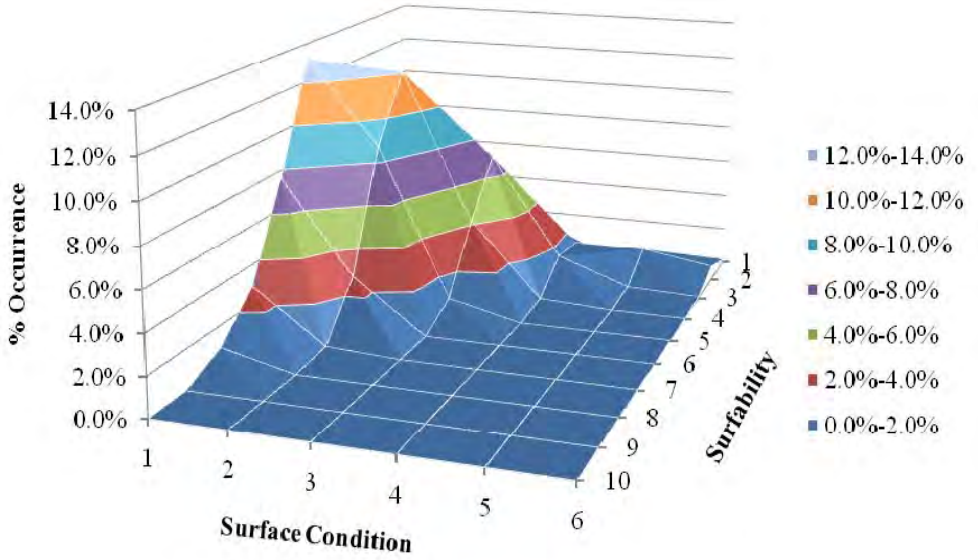

Figure 6 Joint Distribution of Surface Condition and Surfability

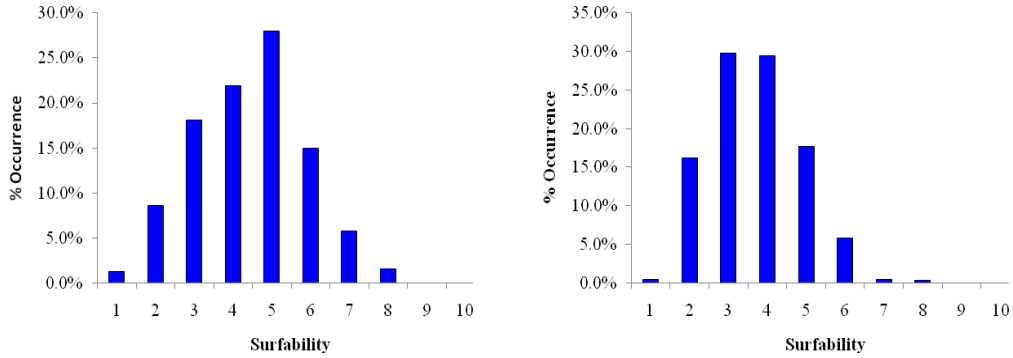

Figure 7 Histogram Comparison of Morning (left) and Afternoon (right)

OTHER

Seasonality: The time series of surfability is a simple indicator of the seasonality of surfability. The measured data indicates the period between Oct-Dec promotes the highest surfability. In southern California, the autumn thru early winter period coincides with the presence of extratropical swell conditions unaccompanied by stormy rainfall events. Stormy rainfall events tend to degrade surfability.

Crowd Counts: Crowd counts are an indicator of usage by surfers. Not surprisingly, high usage is well correlated with high surfability. Additionally, the data indicates the summer months with the most high usage events, a conclusion also not unexpected.

Comments: The descriptive comments reported by the observer for each observation are very informative and useful to further illuminate individual observations. A sampling for a low scoring and high scoring surf condition include:

Score 1: "Hacked-up, blown-out garbage in the 4'-6' range. Very poor overall."
Score 8: "Clean peaks, with lined-up workable walls. Looking really rippable."

The low scoring comment illustrates the point that even though the wave heights were among the larger waves (4-6 ft), the wind is the governing factor creating an unsurfable condition. The high scoring comment includes the term "rippable" which alludes to the condition where the surfer is able to perform many maneuvers on the wave.

DISCUSSION

The original intent of the surfability measurements was to develop a method for systematic classification of the surfing conditions at any location with surfable waves. Using a systematic methodology, measurements obtained before a coastal zone action can be compared to measurements obtained after a coastal zone action in order to assess impacts. The ten point scale is a combination of the objective ("70% waves rideable") and the subjective ("fair"). The objective provides a quantitative measurement of the actual number of surfable waves while the subjective rating is the quality indicator and allows discretion on the part of the expert observer.

The surfability scale was designed with the expectation that the location being evaluated should only be evaluated relative to itself. Every surfing location is unique and a particular surf location cannot and should not be compared with any other location. An average surfable wave at Imperial Beach, CA is in no way comparable to an average surfable wave at the world renowned "Bonzai Pipeline" in Hawaii, USA. Surfability climates vary considerably all over the world and it is not constructive to attempt an absolute comparison of one surfability climate against another surfability climate. Surfability depends on an extensive variety of oceanographic characteristics which renders it pointless to compare surfability among locations. However, it is human nature to unconsciously compare a surf experience against other surf experiences. Thus, it is critically important that the observer performing the subjective evaluation must intrinsically know the criteria for what is considered poor, fair, or excellent for the location under evaluation. This requires an extensive, detailed knowledge of the full range of surfing conditions at the evaluated site in order to objectively make these determinations. Thus, it is best if the observer is a local, long time, and expert surfer with extensive historical background experience so that the objective and subjective determinations can be made.

The surfability scale is designed so that an "average" surfable wave should approximately receive a score of 5. The intent of the scale is to place the most common surfing condition in the middle of the scale and all other surfing conditions, whether more or less favorable, on either side. The scale a priori expects that the majority of the observations will be in the middle with a declining percentage moving away from the most common observations. Thus, the distribution of surfability

observations in most cases will be approximately normally distributed. This feature inherently provides flexibility for the distribution to assume its own characteristic shape incorporating skewness and kurtosis. It is expected that most surfing sites that have surfable waves year round will approximately resemble a normal distribution with some favored skewness and kurtosis. This was clearly shown in this data set. The distribution peak is 4 with nearly equal percentages at 3 and 5 yielding a slightly left skewed but well rounded distribution.

While an approximately normal distribution may be a priori expected for most locations with year round surf, it is likely that some locations could exhibit extreme variations. An example of this potential variation is Pipeline. During the winter season Pipeline breaks with some of the most spectacular plunging surfable waves in the world. These surfing conditions would obviously receive a rating of 10. However, Pipeline can also be completely flat for several summer months and those conditions would receive a rating of 1. Therefore, it is conceivable that the distribution may resemble a "U" shape, with many observations on the low and high ends with fewer observations in the middle.

CONCLUSIONS

Based upon 24 months of visual observation data of the surf zone at Imperial Beach, California, USA, the results contained herein indicate that the proposed method is a reasonable method for describing surfability, or the quality of surfable waves. This analysis provides a quantitative-qualitative scale for describing the surfability at any location. This analysis introduces a ten point scale ranging from extremely poor to excellent. Each point on the scale includes an objective and subjective portion and is expressed in terms of increasingly higher quality rideable surfing waves. Five oceanographic factors (wave height, wave period, wave direction, tide, sea surface condition) were recorded for cross-comparisons with the surfability rating. Joint distributions delineate which conditions are most conducive to high surfability.

The results herein indicate that human nature can induce some bias into the observations. The results suggest the visual observer was "clipping" the highest scoring surfability conditions, i.e. the visual observer was likely reserving the highest scores for "perfect" surfing conditions, which never occurred during the measurement period. The observer is tasked with having expert knowledge of the entire range of surfing conditions at the site, ranging from the very worst to the very best. The observer may have been unconsciously comparing the surfing conditions with other times or locations in his collective surfing experience and thereby introducing a systematic bias. The observer may have been unconsciously reserving the high scores for a similar high scoring "perfect" condition in the past. The preconceived "perfect" conditions may in fact occur only every few years at this location instead of the annual condition as this methodology is designed to measure. Alternatively, the observer may have been unconsciously comparing the high scoring conditions to a high scoring condition at another location. It is incumbent upon the observer to render a completely objective judgment of surfability with no mental comparisons to other places. To do so places an undue burden on the location being measured to

compare to surfing conditions in other locations when in fact those comparisons elsewhere are irrelevant. Thus, it is recognized the utility of the methodology developed herein is directly related to the strengths and frailties of the human observer.

This analysis indicates that visual observations are a reasonable method to obtain engineering accurate information in the surf zone. The data collected in this study suggests that visual observers obtain reasonably accurate wave property information. Recognizing the limitations of the human eye to discern ocean wave properties, visual observations by a trained observer are simple to obtain and have substantial cost advantages over conventional wave measurement methods.

The wave climate measured during this study was not particularly severe. In fact, the measured wave climate was relatively benign. It is acknowledged that the some of the observations made herein may degrade as the sea severity (wave height) increases. The ability of the human eye to accurately estimate very large waves degrades as the wave heights increase, and is substantially muted in the presence of extreme waves. Nonetheless, surfability is still readily definable even in the largest wave conditions. There is no evidence that surfability determination is impacted relative to the other wave properties recorded in this study.

ACKNOWLEDGEMENTS

The author wishes to gratefully acknowledge Messrs. Sean Collins and Kevin Wallis of Surfline, Inc for their assistance in this study.

Re: permit number 6-16-0275
Hearing Date: December 7, 2016
Item No: W14b

To Whom It May Concern:

I am writing to raise some issues that are not covered in the permit request or clarified with any of the documentation on line. I spoke with staff to ensure that my concerns were not already considered and it appears they are valid.

While many us enjoy the San Elijo Lagoon and applaud the work of the Conservancy, there are unintended consequences with the increased traffic and use that occurs with any improvements and will likely be expanded further with the proposed changes.

I live on an access street, North Rios Ave, in Solana Beach. Consistent with item 15 in the staff report, "Public Access Management Plan", there are several issues that should be considered after completion that should be considered with the increased use improvements will attract with the increased use improvements will attract:

1. Many of us rely on street parking and on weekends or during an event, we cannot easily park near our homes. A potential solution would be permitted parking for residents on the street.
2. We have noticed that the current facilities, e.g. fences, are not well maintained or secure. In fact, we witnessed someone leaning on a fence to have it collapse and nearly cause them to fall 30 feet into the lagoon. We hope with the spending on improvements, the new facilities will be maintained for public safety.
3. With the increase in people using the facility, the street adjacent to the entrance and the park suffers from an increase in litter, doggie bags (not the kind you take home from a restaurant!), excrement on the walkways, pet traffic through gardens, dogs off their leash etc. Clearly, the increase in pet use in the Lagoon, especially off leash, puts a risk on the environment by allowing pet-wild animal confrontations, disruption of nesting birds and contamination of the ecosystem with excrement and parasites that can transmit disease across species – including into humans. Further, as my colleagues in the County Health Department can attest, west Nile virus is in the bird population in the Lagoon which puts unattended pets at risk too. The obvious solution is that in addition to fixing up the Lagoon, an increase in education and surveillance by "Park Staff" is required.
4. The recommendations of the staff are very informed. It should be pointed out that the heavy equipment in the Lagoon currently is not apparently removed for refueling. Again, active monitoring should be planned and budgeted.
5. Over the past few years, there has been a noticeable increase in partying after hours with cars racing up the street, noise as well as empty bottles etc. left on the street and in the park. In addition, we had our home broken into. The overwhelming majority of the people show great respect for the park and the adjacent homes. However, the improvements attract users and they are not all so considerate of the environmental impact of their trash. A possible solution is that the access streets are assured of having the police drive by every night and two to three times on the weekends, ideally between 11 pm and 3 am when the most disruptive behavior is observed and heard.

While many of us encourage park development and use for the recreation and education of the community, the capital projects are just part of the plan. Post-modification maintenance and policing have to be included in the plan and sadly paid for. Without this, I am concerned that the improvements to the Lagoon will increase traffic and collateral problems for the Lagoon, local home owners and potentially increase the risk of physical harm to individuals from a minority of offenders. I would request that this permit not be approved without such a plan that considers these issues.

Respectfully,

Peter B Ernst DVM, PhD

CALIFORNIA COASTAL COMMISSION
SAN DIEGO AREA
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W14b

Filed:	10/5/16
180th Day:	4/3/17
Staff:	M. Lasiter -SD
Staff Report:	11/23/16
Hearing Date:	12/7/16

STAFF REPORT: REGULAR CALENDAR

Application No.:	**6-16-0275**
Applicant:	**San Elijo Lagoon Conservancy and California Department of Transportation**
Agent:	Cindy Kincaid, AECOM
Location:	San Elijo Lagoon, Cities of Encinitas and Solana Beach, San Diego County
Project Description:	Restoration of the entire San Elijo Lagoon system, including grading and dredging, removal of dike and weir, construction of pedestrian trails and bridges, removal of non-native species, planting of native species, export of approximately 850,000 cu.yds. of beach quality sediment for reuse at local beaches and storage at off-shore sites, installation of 14,300 cu.yds. of riprap at the inlet, and monitoring
Staff Recommendation:	Approval with Conditions

EXECUTIVE SUMMARY

Commission staff recommends **approval** of coastal development permit application 6-16-0275 for restoration of the San Elijo Lagoon with twenty (20) special conditions. These special conditions address coastal hazards and the protection of coastal resources, including environmentally sensitive habitat areas, terrestrial and marine biological resources, water quality, public access and recreation, and archaeological resources. To ensure that the restoration project

is successful and does not adversely impact coastal resources, comprehensive monitoring programs are required for the following: lagoon habitats, lagoon hydrology, marine habitats, shoreline habitats and profiles, off-shore profiles, and surfing conditions.

A small area of the project, at Cardiff State Beach above the mean high tide line, is located within the City of Encinitas permit jurisdiction. The City has requested that the Commission issue a consolidated CDP for the entire project; as such, the standard of review is Chapter 3 of the Coastal Act with the City of Encinitas's LCP serving as guidance for this portion of the project area.

The proposed project has been designed in coordination with two other transportation infrastructure projects within the same lagoon system, and that have previously been approved by the Commission: (1) Caltrans' replacement of the existing I-5 bridge over San Elijo Lagoon (CDP No. 6-15-2092 and NOID No. NCC-NOID-0005-15), and (2) the San Diego Association of Governments' replacement of the existing railroad bridge over the San Elijo Lagoon tidal inlet and construction of a 1.5-mile segment of double track across the lagoon (Consistency Certification No. CC-0004-15). All three of these projects are specific projects identified in the approved North Coast Corridor Public Works Plan and Transportation and Resource Enhancement Program (NCC PWP/TREP). The NCC PWP/TREP is a single, integrated document for comprehensively planning, reviewing, and permitting the transportation, community, and resource enhancement projects within the NCC extending from La Jolla to Oceanside along the North San Diego County coastline.

The subject restoration project serves as a part of the mitigation required for impacts associated with the highway, rail, and community enhancement projects in the NCC PWP/TREP, including the highway and rail projects at San Elijo Lagoon. The NCC PWP/TREP also requires coordination among projects within the same lagoon system in order to minimize spatial and temporal impacts. As such, these projects will be constructed concurrently over a four-year period by the same contractor which allows greater collaboration and coordination among the major project components. This coordination has resulted in an overall shorter construction period and less environmental impacts due to shared construction staging areas and access points.

Project Background, Purpose, and Description

San Elijo Lagoon is located within the San Elijo Ecological Reserve in the southernmost part of the City of Encinitas. San Elijo Lagoon is a coastal wetland with substantial biological and ecological resources important to the region. The lagoon provides habitat that supports sensitive species, including federally threatened and endangered plants and animals, and resident and migratory wildlife. A mosaic of habitats occurs, linked directly to tidal inundation and frequency, and the species that utilize the lagoon vary by habitat.

Due to historic impacts on the lagoon from surrounding development, the lagoon is degraded and remains in a state of continued decline. Primary causes for this decline include urbanization within the surrounding watershed, historical nutrient dumping directly into lagoon waters, and the construction of transit corridors that traverse and constrain lagoon hydrology. The lagoon is

listed as a 303d impaired water body under the Clean Water Act due to prolonged and recurrent eutrophication events, sedimentation and bacteria. Constrained flow has promoted sedimentation in the lagoon's east basin and reduced the reach of tidal influence. These conditions have exacerbated circulation issues and led to habitat conversion towards a more homogenized set of habitats, resulting in a lagoon system that is less able to support the range of species that rely on it.

The purpose of the proposed project is to enhance and restore the physical and biological functions and services of San Elijo Lagoon by increasing hydraulic efficiency in the lagoon, addressing existing water quality impairments, and halting ongoing conversion of unvegetated wetland habitats to support a more balanced gradient of habitat types. To this end, the applicant proposes to restore 960 acres of the San Elijo Lagoon by re-contouring lagoon elevations and reconfiguring channels to achieve the desired improvements to water quality, water circulation, and habitat mix. Specifically, the proposed project includes the following components:

- Primary Channels: The main channel connected to the tidal inlet would be extended to the south in the central basin and into the east basin.
- Secondary Channels: A new channel would extend from the inlet through the west basin.
- Removal of Weir: An existing dike and weir in the east basin would be removed.
- Habitat Restoration and Revegetation: Native plants in the lagoon would be salvaged prior to and during construction, and planted following the contouring of habitat areas.
- Transitional Habitat Areas: Two transitional areas above tidal elevations would be constructed using a portion of the silt and fine sand dredged onsite.
- Nesting Site: Approximately 23,300 cu.yds. of dredged material would be used to fill a former sewage settling pond in the central basin, capped with two feet of sand, and topped with crushed shell to enhance nesting opportunities.
- Pedestrian Bridges: Two pedestrian bridges would be constructed in the central basin.
- Tidal Inlet Armoring: The west slopes of the inlet would be armored with riprap from the south wing wall of the Coast Hwy 101 Bridge to south of an office building.
- Overdredge Pit: Approximately 850,000 cu.yds. of clean sand would be excavated in the western portion of the central basin to create a temporary 15.6-acre overdredge pit. High nutrient sediment dredged from other areas of the lagoon would be buried in the pit which would be capped with 3 feet of clean material.
    - Reuse of Excavated Materials. Approximately 850,000 cu.yds of sand excavated to create the overdredge pit would be placed at the following sites:
    - 300,000 cu.yds. at Cardiff State Beach for beach nourishment

- 146,000 cu.yds. at Solana Beach for beach nourishment
- 297,000 cu.yds. at SO-6[1] (2012) to be stored for future beach nourishment projects
- 107,000 cu.yds. at SO-6 (2001) to be stored for future beach nourishment projects

Coastal Act Consistency

Dredging and Filling of Coastal Waters and Wetlands

The proposed project includes dredging and filling of coastal waters for restoration, an allowable use under Section 30233(a)(6) of the Coastal Act. The proposed project has been modified several times as a result of coordination with the resource agencies to reduce impacts to sensitive species such as the Ridgeway's rail. As such, the project is the least environmentally damaging alternative and will significantly improve wetland and upland habitat and increase the biological productivity of coastal waters. To ensure the restoration is successful and adequate mitigation is provided, **Special Condition No. 1** requires monitoring and reporting to determine the success of lagoon hydrology, revegetation, aquatic, and terrestrial species and also requires corrective action if results indicate that the lagoon is not functioning as expected or success criteria are not met. Finally, the project has been designed to reuse all dredge spoils that are suitable for beach replenishment.

Water Quality

The proposed project is expected to significantly improve the circulation of the lagoon in order to increase water movement, water quality, and the long-term biological productivity of coastal waters. To ensure coastal waters are not impacted during construction through the unintentional introduction of sediment, debris, or chemicals with hazardous properties, **Special Condition No. 13** requires the applicant to implement a Construction and Pollution Prevention Plan.

Environmentally Sensitive Habitat Areas

Because the proposed project will be constructed concurrently with the I-5 improvements at San Elijo Lagoon and the San Elijo Lagoon Double Track Project, coordination of the projects is necessary to minimize impacts to the lagoon ecosystem during construction. **Special Condition No. 14** requires the applicant to submit a final construction schedule and integration plan that describes coordination between projects.

The proposed project is designed to restore the biological productivity and quality of the San Elijo Lagoon, which contains important biological resources and provides habitats for many plant and animal species. However, impacts to environmentally sensitive habitat areas (ESHAs) and sensitive species could occur during construction activities. To ensure that removal of non-native plants by herbicide application does not adversely impact riparian habitat, **Special Condition No. 2** limits the type of herbicide used and requires that herbicide not be used in open

[1] SO-6 (2012) and SO-6 (2001) are off-shore borrow pits previously used in the San Diego Association of Government's Regional Beach Sand Project I and II.

water areas. To minimize predation and encourage nesting during construction, the applicant proposes to remove or fit perches that provide roost locations for predatory avian species with anti-perching devices. In order to protect biological resources within the lagoon from lighting impacts during night construction, **Special Condition No. 16** requires a Construction Lighting Plan that employs technologies that minimize light intrusion. To minimize noise disturbance, the project has been designed with construction phasing allowing for the movement of sensitive species into areas of the lagoon not impacted by construction noise.

To ensure that the restoration project has been successful in the goal of maintaining and improving habitat **Special Condition No. 1** requires comprehensive Final Lagoon Monitoring Plan to be conducted and reported to the Executive Director. Additionally, **Special Condition No. 19** requires that the applicant provide evidence of obtaining all other State and Federal permits that may be necessary for all aspects of the proposed project.

Marine Resources

A primary biological resource concern raised by the project is the potential for direct or indirect burial of habitats and organisms by the placement of sand at the receiver sites and in the nearshore environment. Because modeling and past studies do not contain sufficient information to support conclusions that nourishment projects are ecologically benign, **Special Condition No. 5** requires that the applicant submit a Final Marine Ecosystem Monitoring and Mitigation Plan to monitor the physical and biological attributes of the marine habitat and communities pre- and post- construction, and defines monitoring criteria to measure success. Should adverse impacts be detected, **Special Condition No. 5** further requires that mitigation be required as determined by the Executive Director.

To ensure that proposed sand volumes do not exceed capacity at the SO-6 offshore sites, **Special Condition No. 7** requires the applicant to conduct pre-construction bathymetric surveys to ensure that the estimated capacity exists at the site, and post-construction bathymetric surveys will be required in order to document changes to the SO-6 pits following construction.

Because temporary increases in turbidity and suspended solids decrease light penetration, impact avian foraging activities, and adversely impact other marine organisms, **Special Condition No. 5** requires a resource specialist to monitor turbidity during all project construction activities, and have the ability to reduce the rate of disposal if large, long lasting turbidity plumes are created.

The California grunion leaves the water at night to spawn on beaches, and because beach replenishment activities could potentially impact the grunion by burying their eggs, changing the beach profile such that juvenile grunion are unable to return to the ocean, or affecting spawning behaviors and egg nest areas, **Special Condition No. 6** requires that the two beaches that would be subject to sand placement activities are monitored for grunion runs during the spawning period and defines the protective measures necessary to avoid these impacts.

To avoid impacts to sensitive species such as California least terns and western snowy plovers that may nest and forage at Cardiff State Beach and Fletcher Cove during construction activities, **Special Condition No. 4** requires that the applicant survey the area prior to construction activities and, if sensitive species are found, coordinate with the U.S. Fish and Wildlife Service to avoid any impacts.

Coastal Hazards

The applicant proposes to install additional riprap along the western bank of the inlet to protect an existing office building and Coast Highway 101 from the increased tidal flow that will result from the project, an allowable use under Section 30235 of the Coastal Act. In this case, the addition of riprap will not adversely impact local shoreline sand supply as the proposed footprint has historically been armored with concrete riprap, construction debris, and sand bags. **Special Condition No. 17** requires the applicant to submit as-built plans following construction to ensure that the riprap armoring conforms with the project analyzed and approved by the Commission.

Projected sea level rise scenarios have guided the restoration planning and engineering for the proposed project, and resulted in the inclusion of manmade transitional areas with higher elevations intended to transition from uplands to wetlands under sea level rise. In addition, the lagoon has existing areas outside of current tidal influence that are anticipated to convert to tidally influenced wetlands as sea level rise occurs.

Modeling for the proposed project has shown that increasing the hydraulic efficiency of the lagoon and enabling the lagoon to drain incoming freshwater more efficiently, will decrease existing flooding of Manchester Avenue, and has therefore been designed to minimize risk of coastal hazards. However, the project is located in a tidally influenced lagoon and there lies an inherent risk from flooding. Excavated materials will be deposited on local beaches that are subject to potential hazards from waves and storms. As such, **Special Condition No. 18** requires the applicant to assume all risks for project activities anticipated to occur in locations that are subject to waves, storms, and flooding.

Public Access and Recreation

The proposed project will be located within public recreational areas including San Elijo Lagoon, Cardiff State Beach, and Fletcher Cove. The project includes the permanent removal of an existing dike/weir in the east basin that is heavily used as a trail. Its removal will promote tidal exchange east of I-5, one of the project's primary goals. While this trail will be eliminated, a new trail connection consisting of two pedestrian bridges and a berm will be constructed to link the Nature Center Loop with Pole Road. In addition, the associated Caltrans project to replace the I-5 bridge includes suspension of a new pedestrian bridge under the bridge which will provide a new north-south connection across the lagoon. To facilitate public use of the new trails, **Special Condition No. 3** requires the applicant to design and implement a trail signage plan.

The reuse of excavated material on nearby beaches will increase the amount of available recreational area for public use. **Special Condition No. 8** requires a shoreline monitoring plan to be developed and implemented to determine the results of beach nourishment over five years. **Special Condition No. 11** requires that beach nourishment activities take place outside of the busy summer season from Memorial Day weekend through Labor Day so that public access is not negatively impacted. **Special Condition No. 15** requires the applicant to comply with measures to ensure that public access is maintained during construction. Because surfing resources could be impacted by the project, **Special Condition No. 9** requires the applicant to monitor surfing conditions prior to and following nourishment activities and submit monitoring reports.

Air Quality

The proposed project has been designed to minimize impacts to air quality by coordinating construction with projects in the same lagoon system, and by utilizing pipelines to transport sediment during material placement activities instead of by truck or barge.

Archaeological Resources

One site within the project area has been identified to contain cultural resources. **Special Condition No. 20** requires that a qualified archaeologist and appropriate Native American consultant be present during all grading and vegetation clearance activities that occur within or adjacent to the recorded archaeological site.

In conclusion, staff recommends approval of CDP 6-16-0275 if conditioned as described above. Further information on this project and staff report can be obtained from Kanani Brown or Melody Lasiter at (619)-767-2370.

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I. MOTION AND RESOLUTION

Motion:

*I move that the Commission **approve** Coastal Development Permit Application No. 6-16-0275 subject to the conditions set forth in the staff recommendation.*

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in conditional approval of the permit and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves coastal development permit 6-16-0275 and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act and will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

II. STANDARD CONDITIONS

This permit is granted subject to the following standard conditions:

1. **Notice of Receipt and Acknowledgment**. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. **Expiration.** If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.

3. **Interpretation.** Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.

4. **Assignment.** The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. **Terms and Conditions Run with the Land.** These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

III. SPECIAL CONDITIONS

This permit is granted subject to the following special conditions:

LAGOON RESTORATION SPECIAL CONDITIONS

1. Final Wetland Habitat and Hydrology Monitoring Plan

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for review and written approval of the Executive Director, a final detailed Lagoon-wide monitoring plan designed by a qualified wetland and upland restoration ecologist for comprehensive monitoring of the lagoon mitigation site, including the tidal inlet, that substantially conforms with the monitoring program titled "Draft Physical and Biological Monitoring Plan for the San Elijo Lagoon Restoration Project" prepared by Norby Biological Consulting and dated July 2016. The Monitoring Plan shall, at a minimum, include the following:

(a) A plan for construction phase and post-project monitoring and maintenance of all restoration areas. The plan shall include provisions for data sharing with University of California Santa Barbara (UCSB) contract scientists. Data and data analysis products shall be obtained from the San Dieguito restoration site and from the reference sites associated with this restoration. If comparisons do not include all reference sites, wetlands that will be used for reference shall be specified in the plan. In addition, this plan shall include:

i. A verification upon completion that the "as-built" restoration condition of each basin conforms to the conditions described in the restoration plan.

ii. A schedule that describes the time period over which monitoring activities will take place in each of the three lagoon basins, including upland areas and the tidal inlet.

iii. A description of field monitoring activities that includes sampling design, number of samples and sampling methods for all categories listed in the monitoring plan as is appropriate, including topography, bathymetry, tidal amplitude, water quality, soils, benthic invertebrates, fish and birds, and all restored habitat types. The response variables used to assess the relative performance standards of the SELRP (hereafter referred to as "relative performance variables") shall be similar to those of the reference wetland habitats. Evaluating whether a particular relative performance variable (e.g., benthic macroinvertebrate diversity) at the SELRP is similar to the reference wetlands requires that the mean value for the performance variable at the San Elijo Lagoon wetlands not be significantly worse than the mean value at the

worst performing reference wetland. A one sample, one tailed approach shall be used to evaluate all such comparisons. An additional analysis shall analyze and describe differences between the baseline conditions and the post-restoration conditions, and specifically how these changes conform to project goals as laid out in the project objectives section 1.2 of the Final Environmental Impact Report for the San Elijo Lagoon Restoration Project (FEIR), adopted February 2016.

iv. Performance standards shall be developed for a 10-year monitoring schedule for tidal wetlands and a 5-year monitoring schedule for all upland habitats and other aquatic resource types or longer if performance standards are not met in the initial time frame. Standards for specific categories shall ensure all of the following:

A. *Topography.* The lagoon system not undergo major topographic degradation (such as excessive erosion or sedimentation) and maintain a specified final wetland acreage amount for each habitat type, (*e.g.* low, mid and high marsh), and tidal elevation within 10 percent of initial habitat objectives.

B. *Water Quality.* Water quality variables, including, at a minimum, dissolved oxygen, seasonal percentage of eutrophic conditions, and turbidity, shall be evaluated through comparison with reference wetlands or aquatic habitat and relative to baseline conditions. Specific metrics shall be determined for these water quality variables and require approval by the Executive Director. Water temperature, water depth, salinity, pH (and any additional explanatory variables) shall also be monitored to inform interpretive analyses and remedial action if required.

C. *Tidal Prism.* The designed tidal prism shall be achieved and maintained for all lagoon basins, and tidal flushing may not be interrupted.

D. *Habitat Areas.* The area of different habitats may not vary by more than 10% from the area indicated in the final Habitat Monitoring and Maintenance Plan.

E. *Biological Communities.* Within five years of restoration, community composition and the total densities and number of species of fish, macroinvertebrates and birds shall be similar to that in similar habitats in the reference wetlands.

F. *Vegetation*. The proportion of total vegetative cover and open space and plant species diversity in each habitat type shall be similar to those proportions and diversity found in the reference sites in both planted and unplanted habitat types upon project completion. The percentage cover of algae shall be similar to the percent cover found in the reference sites.

G. *Spartina Canopy Architecture*. Among wetland locations that achieve the salinity levels and elevations to support native spartina, or which supported spartina prior to restoration, the restored wetland areas shall have a canopy architecture that is similar in distribution to the reference sites, with an equivalent proportion of stems over three feet tall, five years following restoration.

H. *Food Chain Support*. The food chain support provided to birds shall be similar to that provided by the reference sites, as determined by feeding activity of the birds.

I. *Exotics*. The important functions of the wetland not be impaired by exotic species, including zero percent coverage that shall be maintained for California Invasive Plant Council's "Invasive Plant Inventory" species, and no more than five percent coverage for other exotic/weed species.

v. On an annual basis, the applicant shall submit for the review and written approval of the Executive Director, a monitoring report for the inlet maintenance portion of the project. The report shall be submitted annually beginning the first year after Commission approval of the permit. The report shall summarize the effects of the multiple openings, including any changes in the tidal prism caused by external factors (such as upstream development impacts, extreme storm conditions, unusual tides, etc.) that may have contributed to the need for the lagoon inlet openings as well as the inlet breaching's impacts on the biological productivity of the lagoon. Specifically, the annual report shall include the following information:

A. The date of the opening(s) which occurred, along with the date of each subsequent closure and the date of any maintenance dredging;
B. Photos of the beach in front of the lagoon inlet prior to and during dredging activities; and
C. Any noted adverse impacts on lagoon, beach, or dune resources or adjacent park and recreation areas resulting from dredging or disposal activities, and recommendations to avoid or mitigate these impacts in the future.

vi. Interim and final performance standards for all restored habitat types. The applicant shall be fully responsible for any failure to meet assigned performance standards. The REMP Working Group and their Scientific Advisory Committee, may modify performance standards based on site conditions if modified performance standards are equal to or superior to the originally approved standards. If approved performance standards are not achieved, the REMP Working Group shall prescribe remedial measures with guidance from the REMP Scientific Advisory Committee, and the measures shall be immediately implemented by the applicant. If the applicant does not agree that remediation is necessary, the Executive Director may set the matter for hearing by the Coastal Commission.

vii. Monitoring that documents changes in sea level rise, sediment dynamics, and the overall health of the wetland to allow for adaptive management, as needed. The plan shall include triggers for implementing adaptive management options as appropriate if sea level rise is found to outstrip current projections over the life of the project.

viii. Provision for submission of annual reports of monitoring results to the Executive Director for the duration of the required monitoring period, beginning the first year after submission of the "as-built" report for each basin. Each report shall be

cumulative and shall summarize all previous results. Each report shall document the condition of the restoration with photographs taken from the same fixed points in the same directions. Given the scale of the restoration, these fixed points shall be representative of the restoration footprint and shall document changes across a variety of habitat types. Each report shall also include a "Performance Evaluation" section where qualitative observations and quantitative results from the monitoring plan and subsequent data analysis are used to evaluate the status of the restoration project in relation to the interim performance standards and final success criteria.

ix. Provisions for a revised or supplemental restoration plan to be submitted if an annual monitoring report shows that the restoration effort is falling significantly below the interim performance standards. Triggers shall be included in the plan to define the level of nonperformance at which the submittal of a revised or supplemental restoration plan shall be required. The applicant shall submit a revised or supplemental restoration program within 90 days of submittal of an annual report in which significant and ongoing failure to meet performance standards is documented. This supplemental restoration program shall address those portions of the original program which did not meet the approved success criteria, and shall include a description of the adaptive management actions to be taken to ensure success criteria are met.

x. Provisions for the development of a long-term monitoring and management plan to be developed in consultation with the permittee and appropriate resource agencies, and to provide an overall framework to guide the long-term future conditions of the lagoon in anticipation of future sea level rise and any climatic or other changes that may impact the lagoon and its ecology. It shall include an overall description of the monitoring studies to be conducted over the life of the project, for a minimum of 50 years, and shall be designed to provide the information necessary to detect physical and biological changes and adjust management actions in light of evolving management goals.

(b) Final Success Criteria for each habitat type, including, as appropriate,

i. total species richness;
ii. total ground cover of all vegetation and of native vegetation;
iii. total habitat acreage;
iv. vegetative cover of dominant species;
v. wildlife usage including types and frequency of wildlife species;
vi. usage by special status species, including the Western snowy plover, the California Least tern, the Light-footed Ridgway's rail, Least Bell's vireo, Belding's Savanna sparrow and the Southwestern willow flycatcher;
vii. hydrology, including timing, duration and location of water movement; and

viii. presence and abundance of sensitive species or other individual "target" species.

(c) Final Success Criteria for all physical and chemical parameters including, at a minimum:

i. topography;
ii. bathymetry;
iii. tidal amplitude;
iv. water quality; and
v. soils.

(d). The method by which "success" shall be judged, including:

i. The types of comparisons that shall be implemented, including absolute and relative standards comparisons to reference sites and baseline data, data analysis methods, and statistical tests to be performed to confirm that performance standards are met. Methods of analysis and confirmation of performance standards shall be determined in consultation with the staff ecologists of the Coastal Commission, and with representatives from the REMP and the REMP Scientific Advisory Committee;
ii. Identification and description, including photographs, of any high functioning, relatively undisturbed reference sites that shall be used, including the San Dieguito Lagoon Restoration and associated reference wetlands; and
iii. Test of similarity with the chosen reference site(s). This could simply be determining whether the result of a census was above a predetermined threshold. Generally, it shall entail a one- or two-sample t-test that determines if differences between the restoration sites and the reference site are within the maximum allowable difference for each success criteria or performance standard.

(e) Provisions for submission of a final monitoring report to the Executive Director at the end of the final monitoring period. The final report shall be prepared by a qualified restoration ecologist. The report shall evaluate whether the restoration site conforms to the goals, objectives, and success criteria set forth in the approved final restoration program. The report shall address all of the monitoring data collected over the monitoring period. Following the restoration, reports shall be submitted every ten years to ensure that the restoration is maintained over the life of the restoration, which is presumed to be at least 50 years post-restoration.

(f) If the final report indicates that the restoration project has been unsuccessful, in part, or in whole, based on the approved success criteria (performance standards), the applicant shall submit within 90 days a revised or supplemental restoration program to compensate for those portions of the original plan that did not meet the approved success criteria. The permittee shall undertake mitigation and monitoring in accordance with the approved final, revised wetland restoration plan following all procedures and reporting requirements as outlined for the initial plan.

The permittee shall undertake development in conformance with the approved final plan unless the Commission amends this permit or the Executive Director provides a written determination that no amendment is legally required for any proposed minor deviations.

2. **Herbicide Use**

HabitatTM (Imazapyr), or an equivalent environmentally benign herbicide, shall be used to eliminate non-native and invasive vegetation for purposes of habitat restoration only. An environmental resource specialist shall conduct a survey of the project site each day prior to commencement of vegetation removal and eradication activity involving the use of herbicides to determine whether any native vegetation is present and determine setbacks from open water areas of the site. Native vegetation to be retained shall be clearly delineated on the project site with fencing or survey flags and protected. Herbicides shall be hand applied to cut-stumps of woody vegetation, where applicable (e.g., *Arundo Donax*). In the event that non-native or invasive vegetation to be removed or eradicated is located in close proximity to native riparian vegetation or surface water, the applicant shall either: remove non-native or invasive vegetation by hand, or utilize a plastic sheet/barrier to shield native vegetation or surface water from any potential overspray that may occur during use of herbicides. In no instance may herbicide application occur if wind speeds on site are greater than 5 mph or during the 48 hours prior to predicted rain. In the event that rain does occur, herbicide application shall stop and may not resume again until 72 hours after the rain ends.

3. **Trail Signage Plan**

PRIOR TO COMMENCEMENT OF CONSTRUCTION, the applicant shall submit, for the review and written approval of the Executive Director, a Trail Signage Plan indicating the content and location of all signs and any other project elements that will be used to educate, facilitate, and manage public access to and along lagoon trails. The Trail Signage Plan shall include, at a minimum, the following:

(a) Signs shall be sited and designed to provide clear information without impacting public views and site character;

(b) Site plan indicating the location of all signs;

(c) Plans indicating the type of sign, size of the sign face, size of the letters on the sign, overall height of the sign, and the method of posting (e.g., attached to free standing post, gate, fence); and

(d) Signage shall acknowledge the California Coastal Commission's role in providing public access at this location by including the agency name and logo.

The permittee shall undertake development in conformance with the approved final plan unless the Commission amends this permit or the Executive Director provides a written determination that no amendment is legally required for any proposed minor deviations.

MATERIAL PLACEMENT SPECIAL CONDITIONS

4. **Pre-Construction Biological Surveys and Monitoring During Construction**

The applicant shall retain the services of a qualified biologist or environmental resources specialist (hereinafter, "environmental resources specialist") with appropriate qualifications acceptable to the Executive Director, to conduct sensitive species pre-construction surveys and monitor the project site during beach replenishment construction activities. Prior to the commencement of development, the applicant shall submit a description of the environmental resources specialist's duties and the specialist's on-site schedule to the Executive Director for review and written approval. The applicant shall implement the following requirements:

(a) The environmental resources specialist shall:

i. Survey the project sites and 100 feet to either side of them (upcoast and downcoast) to determine the presence and behavior of any sensitive species one (1) day prior to commencement of any beach construction activities;

ii. If sensitive species are identified, the environmental resource specialists shall report the results of the survey within 24 hours to the applicant, Executive Director, California Department of Fish and Wildlife (CDFW), and the United States Fish and Wildlife Service (USFWS); and

iii. Monitor the project sites during all beach construction activities.

(b) Pre-Construction Biological Surveys. In the event that the environmental resources specialist reports finding any federally or state-designated sensitive wildlife species (including but not limited to California grunion, western snowy plover, or California least terns) exhibiting reproductive or nesting behavior during the pre-construction surveys, the applicant shall delay work, and promptly notify the Executive Director, CDFW, and USFWS. Project activities may commence only upon written approval of the Executive Director, following consultation with CDFW and USFWS.

(c) Biological Monitoring During Construction. Prior to the initiation of beach construction activities each day, the environmental resources specialist shall inspect the beach area to preclude impacts to sensitive wildlife species. Beach construction activities may not occur until any sensitive wildlife species (e.g., western snowy plovers, California least terns) have left the project area and its vicinity. In the event that the environmental resources specialist determines that any sensitive wildlife species exhibit reproductive or nesting behavior, the applicant shall cease work and promptly notify the Executive Director, CDFW, and USFWS, including the nature and location of the observations made. Beach construction activities may resume only upon written approval of the Executive Director, following consultation with CDFW and USFWS.

The applicant shall submit documentation prepared by the environmental resources specialist that provides the results of each daily pre-construction survey, including any sensitive wildlife species observed and their associated behaviors and activities.

If significant impacts or injury occur to sensitive wildlife species, the applicant shall promptly notify the Executive Director, CDFW, and USFWS. The Executive Director, in consultation with CDFW and/or USFWS, will determine the appropriate action or mitigation to be taken.

(d) Turbidity Monitoring. The environmental resources specialist shall monitor and document the turbidity of coastal waters during all beach construction activities. Digital photographs with a time stamp shall be taken from representative positions on the bluffs or upland above the sites. Positions shall be geo-referenced and oriented to the same perspective over the course of the project. Photographs shall be taken prior to the start of daily beach construction activities, at mid-day, and following the end of daily beach construction activities. If turbidity levels are significantly increased due to construction activities for more than two (2) consecutive days then the rate of sand placement shall be reduced so that large, persistent turbidity plumes are no longer created. Once all sand placement operations have ceased, the applicant shall monitor and document the extent and duration of any lasting turbidity plumes. The final results of all turbidity monitoring shall be reported to the Executive Director within thirty (30) days following completion of beach replenishment construction.

5. **Marine Ecosystem Monitoring and Mitigation Plan**

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director, for review and written approval, a final Marine Ecosystem Monitoring and Mitigation Plan for monitoring the physical structures and biological communities of the three (3) following marine ecosystems: sandy beach, rocky intertidal, and subtidal rocky reef. The monitoring and mitigation plan shall provide an overall framework to guide monitoring of the physical structures and biological communities associated with these marine ecosystems, in and immediately adjacent to the Cardiff State Beach and Fletcher Cove replenishment footprints, as well as a minimum of two (2) reference sites for each respective ecosystem. The plan shall also provide mitigation options for potential impacts to these intertidal and subtidal marine ecosystems. The monitoring and mitigation plan shall be developed in consultation with state and federal agencies including the California Department of Fish and Wildlife, California State Lands Commission, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and U.S. Army Corps of Engineers.

(a) Marine Ecosystem Monitoring Plan. The Marine Ecosystem Monitoring Plan shall describe the sampling methods, analytical techniques, criteria, and assessment approaches for determining whether the approved project has exerted adverse impacts upon the respective marine ecosystems. The terms ‘direct’ and ‘indirect’ as they relate to definition of adverse impacts shall refer to the spatial (within and outside of permitted replenishment footprint areas) and temporal (whether temporary or permanent) nature of any observed changes, as well as their severity (sub-lethal or lethal). The monitoring plan shall include clear and specific identification of the potential impact areas (in sandy beach, rocky intertidal, and subtidal rocky reef ecosystems) within and near the beach replenishment project footprints. It shall also specify two (2) reference sites for each of the ecosystems (sandy beach, rocky intertidal, and subtidal rocky reef), which are preferably located together. The marine ecosystem monitoring locations in the immediate project area shall be established based upon the project footprint and model-predicted sedimentation patterns. Reference site locations shall be based on similarity to the respective marine ecosystems in the project area and proximity to the project area. In addition the plan shall include, at a minimum, the following:

i. Existing Conditions. The plan shall include a description and historical review of the physical structures and biological communities of the sandy beach (i.e., sand

specifications, wrack, infaunal invertebrates), rocky intertidal (i.e., rock size and type, algae, sessile and motile invertebrates), and subtidal rocky reef (i.e., rock size and type, algae, sessile and motile invertebrates) marine ecosystems in the vicinity of the beach replenishment project sites. The historical review shall include a summary of past quantitative survey and monitoring work (e.g., annual kelp canopy areal extent data, Marine Protected Area Monitoring Enterprise, Multi-Agency Rocky Intertidal Network survey work) conducted on these ecosystems, in order to document trends in areal extent, species composition, and community structure and dynamics for comparison with the post-project monitoring results.

ii. Monitoring Objectives. The monitoring objectives shall include:

A. Fine-scale mapping of physical structures via remote-sensing techniques associated with the sandy beach, rocky intertidal, and subtidal rocky reef ecosystems, within the vicinity of the project footprints and at a minimum of two (2) reference sites;

B. Quantitative characterization of biological communities via in situ field methods for sandy beach, rocky intertidal, and subtidal rocky reef ecosystems including algal and invertebrate (infaunal for beaches, sessile and motile for rocky ecosystems) components, within the vicinity of the project footprints and at a minimum of two (2) reference sites;

C. Identification of any direct or indirect adverse impacts (with respect to space, time, and severity) to sandy beach, rocky intertidal, or subtidal rocky reef ecosystems resulting from the project;

D. And, identification of likely causes of any documented adverse impacts to the sandy beach, rocky intertidal, or subtidal rocky reef ecosystems, including but not limited to burial, scouring, and turbidity.

iii. Monitoring Design. Monitoring shall be divided into two (2) distinct phases utilizing the same monitoring design. The fall season shall be defined as from September 1 to November 30.

A. Fall pre-construction monitoring shall be completed prior to commencement of project construction to establish pre-project baseline conditions.

B. Post-construction annual fall monitoring shall be completed for five (5) years following the completion of all sand placement activities.

iv. Monitoring Methods. The plan shall include detailed monitoring methods and a schedule for their execution with the intention of meeting the monitoring objectives; specifically, methods to monitor for and quantify potential direct and indirect adverse impacts to sandy beach, rocky intertidal, and subtidal rocky reef ecosystems, within the project footprint and at a minimum of two (2) reference sites. At a minimum, the applicant shall incorporate the following methods in the final plan:

A. Remote-Sensing Census of Physical Structures. Remote-sensing census techniques shall be used to map sandy beach, rocky intertidal, and subtidal rocky reef ecosystems in the project areas, and at a minimum of two (2) reference sites

outside the influence of the project areas, with the highest accuracy possible. This shall address areas of:

1) Rocky intertidal, including areas with and without surfgrass, via aerial imagery;
2) Subtidal rocky reefs, including areas with and without kelp, via side scan sonar;
3) Kelp canopy, via aerial imagery; and
4) Beach wrack, via aerial imagery.

B. In Situ Intertidal and Subtidal Field Sampling. The intertidal and subtidal field sampling methods employed shall be capable of characterizing finer-scale physical structures and the biological communities of the sandy beach, rocky intertidal, and subtidal rocky reef ecosystems. Physical sampling shall document substrate relief and rugosity, available crevices and vertical surfaces, and sand cover. Biological sampling shall document the beach infaunal invertebrate and rocky intertidal and subtidal rocky reef algal and invertebrate (sessile and motile) community structures.

The intertidal and subtidal field sampling of sandy beach, rocky intertidal, and subtidal rocky reef ecosystems shall be designed to discover pick up, at a minimum, a 20% change between the respective impact and reference sites. The proposed replication shall be based on preliminary sampling data and a statistical power analysis.

v. Criteria for Detecting Adverse Impacts. The plan shall include criteria (relative or fixed) for determining whether the project has resulted in direct or indirect adverse impacts (spatial, temporal, or varying degrees of severity) upon sandy beach, rocky intertidal, or subtidal rocky reef ecosystems. The criteria shall be amenable to quantitative assessment and shall include estimates of the areas of ecosystem lost or significantly impacted as a result of the project (e.g. substrate relief and rugosity, available crevices and vertical surfaces, sand cover, and habitat-forming species such as kelp and surfgrass). The criteria shall also address significant changes in the structure and function of the biological communities (e.g., number and abundances of algal and invertebrate species, invasive species, recruitment, guild) due to adverse impacts resulting from the project.

vi. Quantitative Criteria Assessment. An integrated assessment approach based upon annual monitoring results shall be developed to determine whether the project has resulted in adverse impacts to the sandy beach, rocky intertidal, or subtidal rocky reef ecosystems. When assessing census criteria relative to the reference sites, and in order to safeguard against the potential asymmetry of false positive and false negative errors in census data, these errors shall be measured and taken into account.

Individual sampling criteria shall be assessed by any statistically significant differences relative to the reference sites. Where α is between 0.000-0.500, and $\alpha \leq$ effect size it shall be concluded that the respective criteria is unmet and therefore out

of compliance, and when $\alpha >$ effect size, the respective criteria is met and shall be considered in compliance. Where $\alpha > 0.500$ and effect size > 0.500, compliance with the respective criteria shall be considered inconclusive and require further examination.

It shall be assumed that any statistically significant adverse impact that is detected is a result of the project unless the applicant can provide compelling evidence to the contrary (e.g., development of local urchin barrens, wastewater spills, or other localized catastrophic events).

An assessment with respect to potential mitigation requirements shall be made following the final year of monitoring.

vii. Monitoring Reports. Annual reports shall include a review of all previous monitoring and provide results from the most recent event, and shall be submitted no later than March 31 of the following year for review and approval by the Executive Director. A report at the end of the 5-year monitoring term shall determine whether any adverse impacts to marine ecosystems have occurred as a result of the project. If adverse impacts are determined to have occurred after the 5-year review, the Executive Director will assess the need for mitigation.

Marine Ecosystem Mitigation and Monitoring. If it is determined that mitigation shall be necessary, an appropriate mitigation ratio for impacts upon marine ecosystems shall be determined by the Executive Director at the time that adverse impacts are reported.

In response to any mitigation needs, the applicant shall develop an ecosystem-specific mitigation plan for each impacted ecosystem, which shall provide the overall framework to guide the mitigation work, for review and approval of the Executive Director. The revised mitigation and monitoring program shall be processed as an amendment to the coastal development permit unless the Executive Director determines that no permit amendment is required.

6. **Grunion Monitoring & Avoidance Plan**

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director, for review and written approval, a Grunion Monitoring and Avoidance Plan. The applicant shall retain the services of a qualified biologist or environmental resources specialist (hereinafter, "environmental resources specialist") with appropriate qualifications acceptable to the Executive Director. The applicant shall adhere to the following provisions in order to avoid impacts to mature grunion and to grunion eggs during a spawning event. The annually published California Department of Fish and Wildlife (CDFW) expected grunion runs shall be used to determine possible grunion spawning periods. The plan shall, at a minimum, include the following:

(a) Beginning at least two (2) weeks prior to commencement of sand placement activities, and throughout the sand placement work, during the grunion spawning period of March 1 through August 31, Cardiff State Beach and Fletcher Cove shall be monitored for grunion runs, excepting areas where there is no sand, such as 100% cobble.

(b) Grunion monitoring shall be conducted by the environmental resources specialist for 30 minutes prior to, and two hours following, the predicted start of each spawning event. Sufficient personnel shall be utilized to ensure that the entire replenishment site is monitored during the specified period. The magnitude and extent of a spawning event shall be defined in 300-foot segments of beach using the Walker Scale.

(c) If a grunion run consisting of 0-100 individual fish per segment (Walker Scale of 0 or 1) is reported within two weeks prior to, or during, beach replenishment work, the applicant does not need to take any avoidance action for grunion eggs. No mature grunion may be buried or harmed as a result of construction/beach replenishment.

(d) Within two weeks prior to construction commencement, if a grunion run consisting of more than 100 individual fish per segment (Walker Scale of 2, 3, 4, or 5) is reported, the applicant shall avoid mobilization on the beach segment(s) and additionally, shall avoid a 100-foot buffer on either side of the segment(s), to ensure that no grunion eggs are buried or disturbed at the construction site. The applicant shall adapt the beach construction schedule to avoid operations on beach segments with a Walker Scale of 2, 3, 4, or 5 and their associated buffers. No mature grunion may be buried or harmed as a result of construction/beach replenishment.

(e) If beach construction has already commenced, and a grunion run consisting of more than 100 individual fish per segment (Walker Scale of 2 or 3) is reported, the applicant shall avoid impacts to grunion eggs to the extent feasible, and then shall minimize impacts to grunion eggs through measures pursuant to subsection (g) below. No mature grunion may be buried or harmed as a result of beach replenishment.

(f) If beach construction has already commenced, and a grunion run consisting of more than 1000 individual fish per segment (Walker Scale of 4 or 5) is reported, no impacts to grunion eggs may occur. The applicant shall avoid impacts to grunion eggs in that portion of the beach construction site through alteration of the discharge point, sand spreading, and/or shifting sand receiver site boundaries. Beach construction activities at this location shall cease if avoidance measures are not feasible. No mature grunion may be buried or harmed as a result of beach replenishment.

(g) The applicant shall develop a list of feasible measures, subject to written approval of the Executive Director in consultation with CDFW, NMFS and ACOE, taking into consideration the size of the sand receiver site, stage of mobilization, construction constraints, etc., that may be utilized to allow sand replenishment work to continue while avoiding and minimizing impacts to eggs within the two week spawning period.

7. **Off-Shore Surveys**

WITHIN SIX MONTHS PRIOR TO PLACEMENT OF SAND AT THE S0-6 SITES, the applicant shall conduct pre-construction bathymetric surveys of the SO-6 pits to identify their capacities to receive sand. The applicant shall submit the results of pre-construction surveys to the Executive Director for review and written approval prior to commencement of sand placement activities at either of the SO-6 sites. If the surveys identify the SO-6 sites do not have the anticipated capacities for the proposed sand placement, the applicant shall apply for an

amendment to the coastal development permit to identify an alternative location for the excess sand to be placed. Sand placement at the SO-6 sites may not result in a final seafloor elevation greater than the surrounding natural seafloor contours. Bathymetric surveys of the SO-6 pits shall also be conducted within four weeks post construction and one year following completion of sand placement. All survey results shall be submitted to the Executive Director.

8. **Shoreline Monitoring Plan**

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director, for review and written approval, a detailed Beach Profile Monitoring Plan for shore and nearshore monitoring at and near the receiver sites at Cardiff State Beach and Fletcher Cove.

(a) Monitoring at and adjacent to the receiver sites shall address the following concerns:

i. Confirm as-built project plans for location and deposition amounts and document any plan revisions;
ii. Seasonal and inter-annual changes to the receiver sites, in width of dry beach, subaerial and nearshore slope, offshore extent of nourished toe, and overall volume of sand in the profile;
iii. Extent of transport of material up- and down-coast from the receiver sites; and
iv. Time period over which the beach benefits related to the project can be identified as distinct from background conditions.

(b) The plan shall be prepared by a qualified engineer with experience in coastal engineering and include, at a minimum, the following:

i. Field surveys of the receiver sites and adjacent areas. Unless otherwise indicated, all profiles shall extend from an upland fixed location or monument, across the beach, through the nearshore, to closure depth. Profiles shall be prepared within six months prior to sand placement, promptly upon completion of sand placement (this survey may be terminated offshore at the toe of the project rather than going to closure), and 3 months after completion of sand placement. In addition, beach profile monitoring shall be conducted on a semi-annual basis each spring and fall for five (5) years following completion of sand placement.
ii. There shall be a minimum of four profiles through the Cardiff State Beach receiver site, and at least one profile up-coast and one profile down-coast of this receiver site. The transect downcoast shall be at least 400 feet from the southern end of the receiver site and no further than 2,000 feet from the southern end of the receiver site. There shall be a minimum of one profile through the Fletcher Cove receiver site, and at least one profile up-coast and two profiles down-coast of this receiver site. A profile from the unnourished section between the sites may be used to provide both upcoast and downcoast information for one another.
iii. Monitoring information shall be analyzed regularly for any changes that have occurred at the receiver sites. To the extent practicable, these reports shall incorporate information

from the San Diego Regional Monitoring Program on both historic changes at the receiver sites and on-going regional shoreline trends.

iv. A site specific determination of the current location of the Mean High Tide Line (MHTL) shall be conducted at the beach receiver sites following beach nourishment, with the consultation and written confirmation of the State Lands Commission.

v. Oblique aerial photographs of the receiver sites shall be taken semi-annually during the first two years following the completion of sand placement, and annually during Year 3 and Year 4 following completion of sand placement.

vi. Annual monitoring reports and a final report evaluating long-term effects of the sand placement shall be submitted to the Executive Director, NMFS, CDFW, and USACE.

The permittee shall undertake development in conformance with the approved final plan unless the Commission amends this permit or the Executive Director provides a written determination that no amendment is legally required for any proposed minor deviations.

9. **Surf Monitoring Plan**

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director, for review and written approval, a Surf Monitoring Plan to visually monitor surfing conditions at and adjacent to Cardiff State Beach and Fletcher Cove before and after sand placement. The Surf Monitoring Plan shall be in substantial conformance with the "Surfing Monitoring Program Overview," submitted to the Commission on November 16, 2016, and shall include, at a minimum, the following:

(a) Identify the major surfing breaks at and adjacent to Cardiff State Beach and Fletcher Cove and determine appropriate monitoring sites;

(b) Document morning conditions on video and/or using a standardized data sheet, as follows:

i. Pre-construction monitoring shall begin two weeks prior to sand placement, and take place 3 times per week over 14 days; and

ii. Post-construction monitoring shall begin within two weeks following completion of sand placement, and take place 3 times per week over 30 days.

(c) Surf monitoring shall include estimates of wave height, type of wave (hollow or mushy), breaker distance from shore, length of peel, and existence of backwash;

(d) Conduct standardized interviews with surfers using a questionnaire;

(e) Estimate the density of surfers at each site surfing site during monitoring; and

(f) A final report that includes the monitoring results and an analysis of any change in surfing conditions shall be submitted to the Executive Director within 90 days of the final survey.

The permittee shall undertake development in conformance with the approved final plan unless the Commission amends this permit or the Executive Director provides a written determination that no amendment is legally required for any proposed minor deviations.

10. **Sand Placement Plan**

By acceptance of this permit, the applicant agrees to employ the following best management practices when conducting beach nourishment activities, to the extent feasible:

(a) Avoidance of sediment compaction;

(b) Careful timing of operations to minimize biotic impacts and enhance recovery;

(c) The selection of locally appropriate techniques;

(d) The implementation of several small projects rather than a single large project, including repeated application of sediment in shallow layers (<30cm) rather than single pulses that kill fauna by deep burial;

(e) Interspersion of nourished beach sections with unaffected areas; and

(f) Importing sediments and creating beach profiles that match the original beach conditions as closely as possible.

11. **Timing of Construction**

By acceptance of this permit, the applicant agrees that beach nourishment activities at Cardiff State Beach and Fletcher Cove shall be prohibited from Memorial Day weekend through Labor Day unless, due to extenuating circumstances (such as tidal issues, extensive delays due to severe weather, or other environmental concerns), the Executive Director authorizes such work.

PROJECT-WIDE SPECIAL CONDITIONS

12. **Final Plans**

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and written approval of the Executive Director, two full-size sets of the following final plans:

(a) Restoration Plans that substantially conform with the plans submitted to the Commission, titled "San Elijo Lagoon Restoration Project Grading and Restoration Plans" dated February 12, 2016, except that:

  i. Pedestrian bridges shall include no armoring or any other form of protection.

  ii. The plans may eliminate grading/dredging of a channel in the southwest portion of the central basin adjacent to the overdredge pit.

  iii. The plans may eliminate the upland transitional area in the southern portion of the central basin.

(b) Beach Profile Plans shall be prepared by a licensed engineer.

The permittee shall undertake development in conformance with the approved final plans unless the Commission amends this permit or the Executive Director determines that no amendment is legally required for any proposed minor deviations.

13. **Construction and Pollution Prevention Plan**

PRIOR TO COMMENCEMENT OF CONSTRUCTION, the applicant shall submit, for the review and written approval of the Executive Director, a Construction and Pollution Prevention Plan prepared and certified by a qualified licensed professional. The final Plan shall demonstrate that all construction, including, but not limited to, clearing, grading, staging, storage of equipment and materials, or other activities that involve ground disturbance; building, reconstructing, or demolishing a structure; and creation or replacement of impervious surfaces, complies with the following requirements:

(a) Protect Public Access. Construction shall protect and maximize public access by all of the following:

i. Staging and storage of construction equipment and materials (including debris) may not take place on the beach. Staging and storage of construction equipment and materials shall occur in inland areas at least 50 feet from coastal waters, drainage courses, and storm drain inlets, if feasible. Upon a demonstration of infeasibility due to site constraints, the applicant may submit a request for review and written approval to the Executive Director for staging and storage of construction equipment and materials closer than 50 feet from coastal water, drainage courses, and storm drain inlets. Construction is prohibited outside of the defined construction, staging, and storage areas.

ii. All construction methods to be used, including all methods to keep the construction areas separated from public recreational use areas (e.g., using unobtrusive fencing or equivalent measures to delineate construction areas), shall be clearly identified on the construction site map and described in the narrative description.

iii. All beaches, beach access points, public trails, and other recreational use areas impacted by construction activities shall be restored to their pre-construction condition or better within three days of completion of construction. Any beach sand impacted shall be filtered as necessary to remove all construction debris from the beach.

iv. Sand from the beach, cobbles, or shoreline rocks may not be used for construction material.

(b) Minimize Erosion and Sediment Discharge. During construction, erosion and the discharge of sediment off-site or to coastal waters shall be minimized through the use of appropriate Best Management Practices (BMPs), including, at a minimum:

i. Land disturbance during construction (e.g., clearing, grading, and cut-and-fill) shall be minimized, and grading activities shall be phased, to avoid increased erosion and sedimentation.

ii. Erosion control BMPs (such as mulch, soil binders, geotextile blankets or mats, or temporary seeding) shall be installed as needed to prevent soil from being transported by water or wind. Temporary BMPs shall be implemented to stabilize soil on graded or disturbed areas as soon as feasible during construction, where there is a potential for soil erosion to lead to discharge of sediment off-site or to coastal waters.

iii. Sediment control BMPs (such as silt fences, fiber rolls, sediment basins, inlet protection, sand bag barriers, or straw bale barriers) shall be installed as needed to trap and remove eroded sediment from runoff, to prevent sedimentation of coastal waters.

iv. Tracking control BMPs (such as a stabilized construction entrance/exit, and street sweeping) shall be installed or implemented as needed to prevent tracking sediment off-site by vehicles leaving the construction area.

v. Runoff control BMPs (such as a concrete washout facility, dewatering tank, or dedicated vehicle wash area) shall be implemented during construction to retain, infiltrate, or treat stormwater and non-stormwater runoff.

(c) Minimize Discharge of Construction Pollutants. The discharge of other pollutants resulting from construction activities (such as chemicals, paints, vehicle fluids, petroleum products, asphalt and cement compounds, debris, and trash) into runoff or coastal waters shall be minimized through the use of appropriate BMPs, including:

i. Materials management and waste management BMPs (such as stockpile management, spill prevention, and good housekeeping practices) shall be installed or implemented as needed to minimize pollutant discharge and polluted runoff resulting from staging, storage, and disposal of construction chemicals and materials. BMPs shall include, at a minimum:

A. Covering stockpiled construction materials, soil, and other excavated materials to prevent contact with rain, and protecting all stockpiles from stormwater runoff using temporary perimeter barriers.

B. Cleaning up all leaks, drips, and spills immediately; having a written plan for the clean-up of spills and leaks; and maintaining an inventory of products and chemicals used on site.

C. Proper disposal of all wastes; providing trash receptacles on site; and covering open trash receptacles during wet weather.

D. Prompt removal of all construction debris from the lagoon and beach.

E. Detaining, infiltrating, or treating runoff, if needed, prior to conveyance off-site during construction.

ii. Fueling and maintenance of construction equipment and vehicles shall be conducted off site if feasible. Any fueling and maintenance of mobile equipment conducted on site may not take place on the beach, and shall take place at a designated area located at least 50 feet from coastal waters, drainage courses, and storm drain inlets, if feasible (unless those inlets are blocked to protect against fuel spills). The fueling and maintenance area shall be designed to fully contain any spills of fuel, oil, or other contaminants. Equipment that cannot be feasibly relocated to a designated fueling and maintenance area may be fueled and maintained in other areas of the site, provided that procedures are implemented to fully contain any potential spills.

(d) Minimize Other Impacts of Construction Activities. Other impacts of construction activities shall be minimized through the use of appropriate BMPs, including:

i. Soil compaction due to construction activities shall be minimized, to retain the natural stormwater infiltration capacity of the soil.

ii. The use of temporary erosion and sediment control products (such as fiber rolls, erosion control blankets, mulch control netting, and silt fences) that incorporate plastic netting (such as polypropylene, nylon, polyethylene, polyester, or other synthetic fibers) shall be avoided, to minimize wildlife entanglement and plastic debris pollution.

(e) Construction In, Over, or Adjacent to Coastal Waters and Habitat. Construction taking place in, over, or adjacent to coastal waters and habitat shall protect the coastal waters and habitat by implementing additional BMPs, including:

i. The majority of work shall take place during daylight hours, to the greatest extent feasible.

ii. All construction equipment and materials shall be stored beyond the reach of tidal waters. All construction equipment and materials shall be removed in their entirety from the beach area by sunset each day that work occurs. The only exceptions may be for erosion and sediment controls and/or construction area boundary fencing, where such controls and/or fencing are placed as close to the base of the seawall/bluff or back of the beach as possible, and are minimized in their extent.

iii. Tarps or other devices shall be used to capture debris, dust, oil, grease, rust, dirt, fine particles, and spills to protect the quality of coastal waters.

iv. All erosion and sediment controls shall be in place prior to the commencement of construction, as well as at the end of each workday. At a minimum, if grading is taking place, sediment control BMPs shall be installed at the perimeter of the construction site to prevent construction-related sediment and debris from entering the ocean, waterways, natural drainage swales, and the storm drain system, or being deposited on the beach.

v. All debris resulting from construction activities shall be removed within 30 days of completion of construction.

(f) Manage Construction-Phase BMPs. Appropriate protocols shall be implemented to manage all construction-phase BMPs (including installation and removal, ongoing operation, inspection, maintenance, and training), to protect coastal water quality.

(g) Construction Site Map and Narrative Description. The Construction and Pollution Prevention Plan shall include a construction site map and a narrative description addressing, at a minimum, the following required components:

i. A map delineating the construction site, construction phasing boundaries, and the location of all temporary construction-phase BMPs (such as silt fences, inlet protection, and sediment basins).

ii. A description of the BMPs that shall be implemented to minimize land disturbance activities, minimize the project footprint, minimize soil compaction, and minimize damage or removal of non-invasive vegetation. Include a construction phasing schedule, with a description and timeline of significant land disturbance activities.

iii. A description of the BMPs that shall be implemented to minimize erosion and sedimentation, control runoff and minimize the discharge of other pollutants resulting from construction activities. Include calculations that demonstrate proper sizing of BMPs.

iv. A description and schedule for the management of all construction-phase BMPs (including installation and removal, ongoing operation, inspection, maintenance, and training). Identify any temporary BMPs that shall be converted to permanent post-development BMPs.

(h) Construction Site Documents. The Construction and Pollution Prevention Plan shall specify that copies of the signed CDP and the approved Construction and Pollution Prevention Plan be maintained in a conspicuous location at the construction job site at all times, and be available for public review on request. All persons involved with the construction shall be briefed on the content and meaning of the CDP and the approved Construction and Pollution Prevention Plan, and the public review requirements applicable to them, prior to commencement of construction.

(i) Construction Coordinator. The Construction and Pollution Prevention Plan shall specify that a construction coordinator be designated who may be contacted during construction should questions or emergencies arise regarding the construction. The coordinator's contact information (including, at a minimum, an e-mail address and a telephone number available 24 hours a day for the duration of construction) shall be conspicuously posted at the job site and readily visible from public viewing areas, indicating that the coordinator should be contacted in the case of questions or emergencies. The coordinator shall record the name, phone number, and nature of all complaints received regarding the construction, and shall investigate complaints and take remedial action, if necessary, within 72 hours of receipt of the complaint or inquiry.

(j) Notification. The permittee shall notify planning staff of the Coastal Commission's San Diego District Office at least three working days in advance of commencement of construction activities and promptly upon completion of construction activities, and shall promptly notify staff of any anticipated changes in the schedule based on site conditions, weather or other unavoidable factors.

(k) Progress Reports. The permittee shall submit annual reports reflecting progress and status of the project, including an identification of any outstanding issues that may have arisen since the last progress report, or are anticipated to arise in the forseeable future.

The permittee shall undertake development in accordance with the approved Construction and Pollution Prevention Plan, unless the Commission amends this permit or the Executive Director provides written determination that no amendment is legally required for any proposed minor deviations.

14. **Final Construction Schedule and Integration Plan**

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and written approval of the Executive Director, a Final Construction Schedule and Integration Plan. The plan shall include, at a minimum, the following components:

(a) A construction schedule for all aspects of the project, and

(b) An integration schedule that describes coordination with the other projects at San Elijo Lagoon, including the Interstate-5 improvements (CDP No. 6-15-2092 and NOID No. NCC-NOID-0005-15) and the San Elijo Lagoon Double Track Project (Consistency Certification No. CC-0004-15).

The permittee shall undertake development in accordance with the approved final plans unless the Commission amends this permit or the Executive Director determines that no amendment is legally required for any proposed minor deviations.

15. **Public Access Management Program.**

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, a Public Access Management Program that includes, at a minimum, the following:

(a) The program shall include a plan for ensuring safe public access to and around construction areas, beach deposition sites, and/or staging areas is maintained during all project operations. The plan shall include a description of the methods (such as signs, fencing, posting of security guards) by which safe public access to and around construction areas, beach deposition sites, and/or staging areas shall be maintained during all project operations. In the event that portions of Cardiff State Beach and/or Fletcher Cove shall be closed to pedestrian use, closures shall be limited to the minimum necessary to conduct active beach nourishment operations only, and signage shall be installed indicating alternative beach access points along the beach available for public access.

(b) The applicant shall be in frequent communication with local jurisdictions and safety agencies, including beach lifeguards, to ensure notification and safety measures are implemented; and provide notifications in the local media to help ensure public awareness of the project and potential construction activities;

(c) The program shall include all necessary temporary access provisions, including any necessary traffic control and crosswalk improvements, to maintain public pedestrian access around the construction areas, beach deposition sites, and/or staging areas. Any temporary pedestrian access improvements within the highway right-of-way shall be reviewed and approved by the appropriate agency;

(d) Public parking areas may only be used for staging or storage of equipment and materials where this is no feasible alternative. Where public parking areas are used for construction staging or storage, the number of public parking spaces (on and off-street) utilized shall be the minimum necessary to implement the project;

(e) The applicant shall post each construction site with a notice indicating the expected dates of construction and/or beach closures;

(f) Lateral access along the back beach shall be maintained throughout construction, with the exception of temporary closures to complete sand placement to the back edge of the beach as necessary, with highest priority for maintenance of access where no alternative lateral access exists (e.g., where a wet beach abuts bluffs); and

(g) Buffers shall be maintained around temporary monobuoys and ocean placement sites to avoid conflicts with water recreation users.

The permittee shall undertake development in accordance with the approved final plans unless the Commission amends this permit or the Executive Director determines that no amendment is legally required for any proposed minor deviations.

16. **Construction Lighting Plan**

PRIOR TO COMMENCEMENT OF CONSTRUCTION, the applicant shall submit, for the review and written approval of the Executive Director, a Construction Lighting Plan. In order to protect biological resources in and adjacent to San Elijo Lagoon, Cardiff State Beach, and Fletcher Cove, the Construction Lighting Plan shall include a final lighting design that includes applicable technologies designed to reduce night glow and light trespass, use the minimum number of lights, and use the minimum level of illumination necessary to light the construction area for operations and safety.

17. **As-Built Plans**

WITHIN 30 DAYS OF COMPLETION OF CONSTRUCTION, the permittee shall submit two copies of As-Built Plans showing all development completed pursuant to this coastal development permit. The As-Built Plans shall be substantially consistent with the approved project plans described in Special Condition 12 above, including all of the same informational requirements specified in those plans. The As-Built Plans shall include a graphic scale and all elevations shall be described in relation to National Geodetic Vertical Datum (NGVD) 88. The As-Built Plans shall be submitted with certification by a licensed civil engineer with experience in coastal structures and processes, acceptable to the Executive Director, verifying that the project has been constructed in conformance with the approved final plans.

The As-Built Plans for the riprap protection on the tidal inlet shall include color photographs that clearly show all components of the as-built project, and that are accompanied by a site plan that notes the location of each photographic viewpoint and the date and time of each photograph. At a minimum, the photographs shall be from representative viewpoints from the inlet located directly upcoast, downcoast, seaward, and landward of the project site.

18. **Assumption of Risk, Waiver of Liability & Indemnity**

By acceptance of this permit, the applicant acknowledges and agrees (i) that the site may be subject to hazards, including but not limited to waves, storms, flooding, landslide, bluff retreat, erosion, and earth movement, many of which will worsen with future sea level rise; (ii) to assume the risks to the permittee and the property that is the subject of this permit of injury and damage from such hazards in connection with this permitted development; (iii) to

unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; and (iv) to indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs (including costs and fees incurred in defense of such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards.

19. **Other Permits**

PRIOR TO COMMENCEMENT OF CONSTRUCTION, the permittee shall provide to the Executive Director a copy of all other necessary State, Federal, and local permits that may be necessary for all aspects of the proposed project, including from the U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Fish and Wildlife, California State Lands Commission, Regional Water Quality Control Board, and the U.S. Army Corps of Engineers. The permittee shall inform the Executive Director of any changes to the project required by the agency. Such changes may not be incorporated into the project until the permittee obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

20. **Archaeological Resources and Monitoring**

By acceptance of this permit, the applicant agrees to have a qualified archaeologist and appropriate Native American consultant present on-site during all grading and vegetation clearance activities that occur within or adjacent to recorded archaeological sites in the project area. Specifically, all ground-disturbing activities adjacent to recorded sites shall be controlled and monitored by the archaeologist with the purpose of locating, recording and collecting any archaeological materials. In the event that any significant archaeological resources are discovered during operations, all work in this area shall be halted and an appropriate data recovery strategy be developed, subject to review and approval of the Executive Director, by the applicant's archaeologist and the native American consultant consistent with CEQA guidelines.

IV. FINDINGS AND DECLARATIONS

PROJECT DESCRIPTION

The San Elijo Lagoon Conservancy (SELC) and California Department of Transportation (Caltrans) proposes to restore 960 acres of the San Elijo Lagoon to improve the function of the lagoon ecosystem by two primary means: 1) recontouring lagoon elevations via grading and dredging to support a more stable mix of habitat types and to remove high nutrient sediment from historical sewage disposal sites and 2) reconfiguring channels to increase hydraulic flow. The project includes the removal of approximately 850,000 cubic yards of high nutrient laden sediment and burial of that sediment within an overdredge pit excavated in the central basin; reuse of approximately 850,000 cubic yards of clean sand (removed from the overdredge pit) for nourishment on nearby beaches, including Cardiff State Beach and Fletcher Cove, and for storage at an off-shore site; removal of non-native species and revegetation with native wetland and upland species; extension and creation of lagoon channels; removal of a dike and weir in the east basin; construction of two pedestrian bridges; addition of approximately 14,300 cubic yards of riprap at the tidal inlet; and implementation of a long-term monitoring plan.

A small area of the project, at Cardiff State Beach above the mean high tide line, is located within the City of Encinitas permit jurisdiction. The City has requested that the Commission issue a consolidated CDP for the entire project; as such, the standard of review is Chapter 3 of the Coastal Act with the City of Encinitas's LCP serving as guidance.

The San Elijo Lagoon Restoration Project (SERP) is being funded by Caltrans and San Diego Association of Governments (SANDAG) as a part of a larger, regional mitigation package (REMP) to address impacts resulting from implementation of the highway, rail, and community enhancement projects in the North Coast Corridor Public Works Plan and Transportation and Resource Enhancement Program (NCC PWP/TREP). This project serves as a substantial mitigation element of the NCC PWP/TREP given the expected wide range of benefits to: sensitive habitat for plants and wildlife, tidal range, water quality, flood control, groundwater recharge, and recreation. As such, the SELRP is expected to enhance regionally significant resources at a lagoon wide level through these proposed restoration efforts. This approach to improve ecological conditions throughout the lagoon is included as an additional enhancement activity identified in the REMP above and beyond other more traditional mitigation requirements that are also required to adhere to specific and more traditional mitigation ratios associated with specific impacts from NCC PWP/TREP projects. The SELRP was therefore not designed to produce specific types or quantities of restored acreages of various habitat types, and similarly does not need an accounting mechanism to track impact acreage totals. Instead, the ecological lift that will occur as a result of this comprehensive restoration will serve as additional mitigation for all NCC PWP/TREP project impacts, including long-term temporary impacts, shading impacts, and indirect and potential temporal wetland and other aquatic habitat impacts. However, the recommended special conditions for the subject project do require identification of performance standards to measure the success of the restoration project.

PROJECT PURPOSE AND NEED

The purpose of the proposed project is to enhance and restore the physical and biological functions and services of San Elijo Lagoon by increasing hydraulic efficiency in the lagoon, addressing existing water quality impairments, and halting ongoing conversion of unvegetated wetland habitats to support a more connected gradient of balanced habitat types (Exhibit 4).

Past studies of the lagoon have indicated that water quality has diminished due to historic sewage disposal, inflow of nutrient rich and polluted water from urban runoff, and lack of circulation in the lagoon due to inefficient channels and obstructions by three separate transportation systems and a weir that traverse the lagoon. Specifically, McLaughlin et al. (2010) concluded: "*Sediment data indicate that the Lagoon has accumulated a large amount of organic matter. Because benthic flux is the major source of N (nitrogen) to the Lagoon, recycling of this organic matter to biologically available forms of nutrients will likely continue to cause problems with algal blooms and hypoxia, even with nutrient reductions [from the watershed], unless restoration is undertaken to flush [or remove] the Lagoon of the fine-grained sediments and improve circulation."* The proposed restoration would address water quality impairments by removing nutrient-impacted sediment and by increasing the tidal prism to improve circulation.

In addition, the wetland habitat has been rapidly converting from mudflat to low- and mid-marsh due to changes in circulation patterns associated with more frequent inlet maintenance; these changes include a decrease in relative water elevations and inundation frequencies. If no action is taken, the loss of ecologically valuable mudflat habitat would continue. A habitat gradient that balances both vegetated and unvegetated intertidal areas is critical to enhance and restore wetland functions and services within the lagoon.

Although the project would involve short term impacts to some wetland and upland habitat, this project is expected to improve water quality, increase tidal expression, and increase the long-term habitat value of the lagoon ecosystem as a whole.

DETAILED DESCRIPTION OF PROJECT COMPONENTS

The proposed project consists of two major components: restoration of the lagoon, and reuse of materials excavated during the restoration. Lagoon restoration would occur in all three lagoon basins (Exhibit 3):

- West basin: approximately 53 acres, between Coast Highway 101 to the west and the Los Angeles-San Diego-San Luis Obispo (LOSSAN) railroad corridor to the east
- Central basin: approximately 356 acres, between the LOSSAN railroad corridor to the west and I-5 freeway to the east
- East basin: approximately 532 acres, east of the I-5 freeway

Lagoon Restoration

Primary Channels

The main channel connected to the tidal inlet would be extended to the south in the central basin as well as into the east basin. These three channels make up the proposed primary channels and would be a minimum of 75 feet wide. The channels have been designed primarily with 5:1

Height to Velocity (H:V) slopes. In constrained areas, a 3:1 (H:V) or 2:1 (H:V) was used. The primary channels have been designed to an elevation of -4 feet NAVD88 to ensure the channels maintain an average depth of 2 feet of water for tidal conveyance and subtidal habitat at the lowest low tide in the lagoon.

Secondary Channels

A new channel would extend from the tidal inlet throughout the length of the west basin. This channel, along with the narrower southern portion of the new primary channel in the central basin, make up the proposed secondary channels and have also been designed primarily with 5:1 (H:V) slopes, except in constrained areas. In these instances, a 3:1 (H:V) was used. Secondary channels have been designed to an elevation of -3 feet NAVD88. Although this elevation is a foot shallower than the main channels, it would still allow for tidal conveyance and subtidal habitat.

Removal of Weir

An existing dike and weir in the east basin would be removed to promote greater tidal exchange east of I-5 and also enhance the ability of freshwater flows to drain from the lagoon.

Overdredge Pit

A temporary 15.6-acre overdredge pit would be created in the western portion of the central basin. Approximately 850,000 cu. yds. of clean sand would be excavated to create the pit and would be used for beach nourishment and stored off-shore for future beach nourishment projects. High nutrient sediment removed from other areas of the lagoon that is not suitable for reuse would be buried in the overdredge pit and the pit would be capped with 3 ft. of clean material. The pit would be excavated to a depth of minus 65 feet NAVD88.

Transitional Habitat Areas

Two transitional areas above tidal elevations would be created to supplement the existing natural transitional habitat that extends around the perimeter of the lagoon. The transitional areas would be constructed using a portion of the silt and fine sand excavated onsite to create the overdredge pit. These areas would offer refugia[2] for anticipated future sea level rise conditions.

Nesting Site

Approximately 23,300 cubic yards of dredged material would be used to fill a former sewage settling pond in the central basin. This area would then be capped with 2 feet of sand and topped with crushed shell to enhance nesting opportunities for California least terns.

[2] An area of refugia is an area where special environmental circumstances have enabled a species or a community of species to survive after displacement to surrounding areas.

Pedestrian Bridges

Two pedestrian bridges would be constructed in the central basin. The northern bridge would span the main channel near I-5 and would be 156 feet long. The southern bridge would span the secondary channel and be 76 feet. This would add 0.25 mile of trails to the current system and create a link between the south and north sides of the central basin, providing additional connectivity and public access around the lagoon.

Habitat Restoration

Prior to and during construction, native plants in the lagoon would be salvaged and non-native plants would be removed from restoration areas. Once habitat areas are contoured, planting and irrigation would occur in transitional habitat areas and in some low marsh habitat areas. Planting would accelerate the colonization process of target habitats, and would focus on areas disturbed during construction. Temporary irrigation would be needed to help establish plants, but would not be required permanently.

The project would utilize low-pressure, land-based earthmoving equipment as well as dredge equipment to minimize impacts to existing vegetation. Grading would occur in areas proposed as mudflats and low marsh adjacent to channels, while dredging would be limited to the creation of the overdredge pit and channels.

Tidal Inlet

The slopes of the inlet would be armored on the west side from the south wing wall of the existing Coast Hwy 101 Bridge to just south of the Plastino Building with 8,500 cu. yds. of quarter-ton stone and 5,800 cu. yds. of 75-lb. “backing class” stone to protect the slopes from being eroded and undermined by stormwater runoff with high velocity, sea level rise, and increased wave action. The rock slope protection depth perpendicular to the slope is 5.5 feet. The width is approximately 16.3 feet at the toe, 12.3 feet at the crest, and 35.7 feet along the slope; the sum of these results is a band of rock that is a total of 64.3 feet wide along the slope when viewing it from the air. The slope of the revetment is 2:1.

Reuse of Materials

The restoration of the lagoon has the potential to generate approximately 850,000 cubic yards of excess material through excavation of the overdredge pit. This excess material has been tested and is suitable for beach nourishment. The applicant proposes placement of the materials at the following sites (Exhibit 12):

- 300,00 cubic yards at Cardiff State Beach in Encinitas, starting south of restaurant row to the Seaside parking lot
- 146,000 cubic yards at Fletcher Cove in Solana Beach
- 297,000 cubic yards at SO-6 (2012), an offshore borrow pit where sand was previously removed for a beach nourishment project (Regional Beach Sand Project II). Sand would be placed in the SO-6 pit and stored for potential future beach nourishment projects.

- 107,000 cubic yards at SO-6 (2001), an offshore borrow pit where sand was previously removed for a beach nourishment project (Regional Beach Sand Project I). Sand would be placed in the SO-6 pit and stored for future potential beach nourishment projects.

Transport of material to nearby beaches at Cardiff and Solana Beach would occur via a pipeline from the lagoon through the inlet, directly to placement sites. Once at the beach, the material would be discharged behind a training dike where the sand would settle from the water slurry mix, and be spread along the beach using bulldozers. Transport of material to SO-6 sites would occur via a pipeline from the lagoon to an offshore barge that would be positioned with anchors and tugs above the precise placement areas. The material would be deposited via a downspout near the ocean floor.

RELATED PROJECTS

The proposed project has been designed in coordination with the following projects within the same lagoon system, all of which have already received approval from the Commission:

Interstate-5 Improvements at San Elijo Lagoon (CDP No. 6-15-2092 and NOID No. NCC-NOID-0005-15)

Caltrans' replacement of the existing I-5 bridge over San Elijo Lagoon will result in a bridge that is wider to accommodate the addition of High Occupancy Vehicle lanes and that is longer to increase hydraulic flow in the lagoon. The lagoon channel under the new bridge will also be widened and deepened. Rock armoring will be installed to provide channel bank and bridge abutment protection and prevent undermining by increased tidal/fluvial flows. In addition, a pedestrian bridge will be suspended under the new bridge, providing a new north-south pedestrian connection across the lagoon. This project is anticipated to begin construction by the end of the year.

San Elijo Lagoon Double-Track Project (Consistency Certification No. CC-0004-15)

The San Diego Association of Governments' project will replace a wood trestle, single track, rail bridge which traverses the San Elijo Lagoon tidal inlet with a wider, double track concrete pile bridge that has a smaller footprint in the lagoon, install riprap on the east side of the tidal inlet, double-track a 1.5-mile segment of the rail through the lagoon, and install a pedestrian undercrossing southwest of the lagoon. This project is also anticipated to begin construction by the end of the year.

Future Inlet Maintenance (CDP No. 6-16-0248)

The San Elijo Lagoon Conservancy conducts annual inlet maintenance for the lagoon. Approximately 40,000 cubic yards of sand is removed annually, utilizing the same land-based approach in the same location as existing inlet management. Maintenance is anticipated to occur in spring (typically April) and require approximately 4 weeks to complete.

PROJECT LOCATION AND BACKGROUND

San Elijo Lagoon is located within the San Elijo Ecological Reserve (Reserve) in the southernmost part of the City of Encinitas in San Diego County. Approximately 960 acres of the 979-acre Reserve is proposed to be restored. The lagoon is bordered by the City of Solana Beach to the south, Manchester Avenue (City of Encinitas) to the north, Rancho Santa Fe (San Diego County) to the east, and Coast Highway 101 and the Pacific Ocean to the west (Exhibit 1).

San Elijo Lagoon has a relatively narrow connection to the ocean and a confluence of freshwater flows from upstream. The lagoon drains the Escondido Creek watershed, which encompasses 200 square kilometers and drains through two main tributaries: Escondido Creek and Orilla Creek. Various transportation infrastructures traverse the lagoon and inhibit freshwater flow to the ocean and tidal exchange into the lagoon, including Coast Highway 101 across the main channel inlet, the railroad bridge between the west and central basins, and the I-5 freeway bridge between the central and east basins. In addition, a weir managed by CDFW extends across the east basin, further restricting freshwater flows from exiting the lagoon. The Reserve also provides recreational opportunities, including more than 7 miles of public hiking trails.

San Elijo Lagoon is a coastal wetland with substantial biological and ecological resources important to the region. The lagoon and adjacent uplands that compose the Reserve provide habitat that supports sensitive species, including federally threatened and endangered plants and animals, and resident and migratory wildlife, such as the Ridgway's rail, southwestern willow flycatcher, California gnatcatcher, western snowy plover, and Belding's savannah sparrow. A mosaic of habitats occur, including mudflats, saltpan, freshwater and brackish marsh, open water, riparian, coastal strand, upland, beach and low-, mid- and high-salt marsh (Exhibit 5). These habitats are linked directly to tidal inundation and frequency, and the species that utilize the lagoon vary by habitat.

Due to historic impacts on the lagoon from surrounding development, the lagoon is degraded and remains in a state of continued decline. Primary causes for this decline include urbanization within the surrounding watershed, a history of sewage dumping directly into lagoon waters, and the construction of transit corridors that traverse and constrain lagoon hydrology. The lagoon is listed as a 303d impaired water body under the Clean Water Act due to prolonged and recurrent eutrophication events, sedimentation and bacterial loads that threaten human health to the point of periodic beach and near-shore closures at the lagoon mouth. Moreover, constrained flow has promoted sedimentation in the lagoon's east basin and reduced the reach of tidal influence. These conditions have exacerbated circulation issues and led to the progressive conversion of saline and brackish-water subtidal and mudflat habitats to freshwater marsh. Within the central basin, a muted tidal prism and sediment deposition has transformed mudflat to salt marsh habitat and low marsh to high marsh. Today, the lagoon remains in a transitional state towards a more homogenized set of habitats, and therefore is progressively less able to support the range and diversity of species that rely on its resources.

Ongoing efforts to improve water quality in the lagoon focus on active management of the lagoon mouth, which has been routinely breached since 1998 to maintain a predominantly open inlet and tidal flushing within the lagoon. Prior to the management of the lagoon as a perennially

open system, the prolonged closure of the lagoon mouth resulted in degradation of many of its ecological functions, including impoundment of freshwater and high biological oxygen demand, which resulted in mass die-offs of fish and invertebrate populations from osmotic shock (cell rupture) and low dissolved oxygen. Prolonged submergence of salt marsh species led to their repeated temporary demise and promoted the establishment and spread of freshwater species. Management of the tidal inlet has increased stability in the system, which now supports a more balanced assemblage of plants and animals, although habitat conversion continues. Inlet management currently allows for cycles of inlet closure and opening, taking into account the pressures of existing conditions at the lagoon. The inlet is kept open most of the time but is allowed to close during the winter season (for short periods of time when temperatures are low and the risk of hypoxia is reduced) to mimic historic periods of mouth closure. These management efforts have improved habitat and water quality relative to the stagnant conditions that previously developed when the inlet was closed for prolonged periods. Other efforts involving removal of invasive species also resulted in some improvement to habitat quality. Although important, these efforts do not remedy the underlying water quality impairments, hydraulic inefficiencies, or loss of functional mudflat within the lagoon.

PERMIT HISTORY

San Elijo Lagoon

The Commission has approved 13 permits for inlet maintenance operations at San Elijo Lagoon (CDP Nos. 6-88-463, 6-89-109, 6-89-241, 6-90-128, 6-90-250, 6-91-3, 6-91-258, 6-93-12 and 6-93-194). These permits authorized opening of the lagoon inlet and dredging of the lagoon's main tidal channel, based on certain water quality conditions utilized as indicators for determining appropriate times to open the lagoon inlet in order to protect the health of the lagoon environment. The Commission has also approved a number of permits and amendments for opening the lagoon inlet that were proposed as experiments to allow the lagoon inlet to remain open for a longer period of time, and involved the removal of a more substantial amount of material (CDP Nos. 6-91-3-A, 6-94-15, 6-95-32, 6-95-142). In January 1997, the Commission approved a permit for multiple openings of the lagoon over a 2-year period (CDP No. 6-96-120). The intent of the project was to keep the lagoon inlet open as long as possible. Given the beneficial effects of maintaining tidal flow, the Commission has since approved additional permits that allow dredging on an as-needed basis to keep the lagoon inlet open (CDP Nos. 6-99-12, 6-05-07, 6-11-014, 6-16-0248).

Beach Nourishment

Initially in 2000, and subsequently in 2011, the Commission has twice approved a countywide beach nourishment program for San Diego County conducted by SANDAG, Regional Beach Sand Project (RBSP) I and II (CDP Nos. 6-00-038 and 6-11-018). Under RBSP I, SANDAG placed approximately two million cubic yards of sand on twelve San Diego County beaches in the Spring and Summer of 2001. Of that amount, 101,000 cubic yards of sand was placed at Cardiff State Beach and 146,000 cubic yards at Fletcher Cove. RBSP II involved the placement of 1.5 million cubic yards on eight San Diego County Beaches between September and December of 2012. Of that amount, 89,000 cubic yards was placed at Cardiff State Beach

(although the permitted amount was 101,000 cubic yards) and 146,000 cubic yards was placed at Fletcher Cove.

In 2013, the Commission approved a 50-year coastal storm damage reduction project (CD No. 0203-13) for the U.S. Army Corps of Engineers to nourish two shoreline segments in the cities of Encinitas and Solana Beach. The storm damage reduction project is designed to achieve a specific footprint on the beach, and not to deposit a set volume of sand. As such, the storm damage reduction project will automatically consider sand existing on the beach at the time of implementation, including the sand placed as part of the proposed restoration project, which is expected to occur prior to the storm damage reduction project. The project is currently awaiting Congressional authorization and funding, and the USACE will then need to work with additional resource agencies, including the Commission, in order to develop and finalize monitoring plans.

STAKEHOLDER HISTORY

The proposed lagoon restoration project has been identified as a mitigation opportunity for the North Coast Corridor Public Works Plan and Transportation and Resource Enhancement Program (NCC PWP/TREP), which includes transportation improvements along both I-5 and the LOSSAN railroad corridor in North San Diego County. In June 2014, the NCC PWP/TREP was finalized, including a Resource Enhancement and Mitigation Program (REMP) that identified the restoration of San Elijo Lagoon as a mitigation project. The REMP was developed through a collaborative process with representatives from various resource agencies including the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the California Department of Fish and Wildlife, the Regional Water Quality Control Board, NOAA National Marine Fisheries Service, the U.S. Environmental Protection Agency, and the California Coastal Conservancy. The development of the REMP was initiated by members of this group as early as 2010 in order to identify regionally significant restoration and enhancement opportunities within the North Coast Corridor (NCC), including the subject restoration project. Through the NCC PWP/TREP, this group has been formalized as the REMP Working Group to provide a process for interagency coordination and meets quarterly to track and guide progress through the planned implementation phases of the NCC PWP/TREP.

In addition, SANDAG and the San Elijo Lagoon Conservancy initiated stakeholder meetings specific to the proposed project in 2007, and expanded those to include a separate breakout agency subgroup meeting in 2010. Together, over 50 meetings have occurred since 2007 that have included participation by regulatory agencies, wildlife agencies, local jurisdictions, and other organizations.

In addition to agency meetings, the San Elijo Lagoon Conservancy, as administrator of the San Elijo Lagoon Restoration Project, provided five opportunities for public input during the 60-day comment period for the release of the Draft EIR/EIS. These events included two citywide meetings, two neighborhood meetings, and a restoration walkabout at the nature center.

LEGISLATIVE FRAMEWORK – SB 468

On September 9, 2011, the California State Legislature approved Senate Bill 468 (SB 468) which details certain requirements of the NCC PWP/TREP, and Governor Brown signed it into law on October 7, 2011. SB 468 is the result of a collaborative effort involving representatives of SANDAG, Caltrans, and the Commission to ensure project design and mitigation measures are included in the NCC PWP/TREP to address (among other things) coastal public access, habitat restoration projects, environmental mitigation measures, and community enhancements. The bill requires consultation with the Commission and other stakeholders on the NCC PWP/TREP, a requirement to establish procedures for addressing improvements within identified areas of the Commission's retained permit jurisdiction as part of implementation, and authorizes the Commission to use Section 30515 of the Public Resources Code as it relates to filing a third-party initiated LCP amendment with the Commission for the NCC PWP/TREP.

Consistent with SB 468, the NCC PWP/TREP includes a comprehensive program with linkages to ensure that rail, highway, transit, community enhancement and required mitigation projects are appropriately linked, phased and implemented in such a manner to benefit coastal resources. In this particular case, the subject restoration project has been closely coordinated with the rail and highway projects within the same lagoon system such that spatial and temporal impacts will be minimized by constructing all three projects concurrently using the same contractor over a four year period.

C. DREDGING & FILLING OF COASTAL WATERS & WETLANDS

Section 30233 of the Coastal Act provides, in applicable part:

> *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*
>
> *(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
>
> *(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
>
> *(3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.*
>
> *(4) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.*

(5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(6) Restoration purposes.

(7) Nature study, aquaculture, or similar resource dependent activities.

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for these purposes to appropriate beaches or into suitable longshore current systems. […]

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary […]

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division.

The proposed project includes the restoration and enhancement of San Elijo Lagoon to improve the long-term function of the lagoon ecosystem by recontouring and reconfiguring the lagoon slopes and channels to increase hydraulic flow, improve water quality, and support a specific mix of habitat types (Exhibit 4). Grading will disturb approximately 133 acres of the 960-acre project area (Exhibit 6) and 850,000 cubic yards of excavated materials will be exported off-site for beneficial reuse on local beaches and for storage at off-shore borrow sites. The project also includes implementation of a habitat restoration plan to salvage existing native plants, replant native wetland and upland plant species and remove non-native plant species.

Section 30233(a) limits dredging and filling activities in wetlands to seven allowable uses, including restoration. In this case, all proposed dredging/grading within wetland areas is for the purpose of restoration of the lagoon ecosystem. Moreover, the proposed grading is necessary to improve the circulation of the lagoon in order to increase water movement, water quality, and the long-term biological productivity of coastal waters, as well as support a more balanced mix of habitat types in the lagoon. Dredging will also remove nutrient-laden sediment that is negatively affecting water quality. Thus, the proposed grading is clearly an allowable use within a wetland pursuant to Section 30233(a)(6).

Section 30233 allows grading in a wetland only where there is no feasible less environmentally damaging alternative to the project. Alternatives to the project must be considered prior to finding that a project satisfies this provision of Section 30233. As noted above, the purpose of

the proposed project is restoration of the San Elijo Lagoon. The Final Environmental Impact Report (FEIR) found that although the proposed project will, in the long-term, significantly improve the wetland and upland habitat on site and increase the biological productivity of coastal waters, the proposed project will result in temporary impacts to sensitive species during initial construction/restoration operations.

Specifically, grading and dredging would occur in areas where sensitive avian species nest and forage. The applicant proposes to implement mitigation measures from the FEIR to minimize impacts to special status avian species during construction. Measures include maintaining a biological monitor on-site, with daily monitoring during breeding season. To encourage the movement of birds to areas of refugia, vegetation clearing, grubbing and inundation will be conducted outside of breeding season, and the biological monitor will walk the project area ahead of machinery in an effort to flush birds and other wildlife into dry conditions. If clearing and grubbing activities occur in inundated areas, the areas will be inundated for at least 24 hours in advance to actively encourage wildlife to relocate from vegetation to be cleared to adjacent non-impacted habitat. Grubbing of vegetation will occur while vegetation is still inundated to minimize the likelihood of contacting marsh birds. Finally, active construction will be limited to two basins at a time so that large areas of refugia in the remaining basin will be available for displaced birds.

As noted above, grading and recontouring the lagoon is integral to the proposed project's objectives to increase hydraulic efficiency, improve water quality, and support a more balanced mix of habitats. Any project alternative that includes grading would result in associated impacts to aquatic and terrestrial species. The "no project" alternative would avoid short term impacts to sensitive species from grading and construction noise. However, the "no project" alternative would not meet any of the project goals, including the long-term improvement of water quality and enhancement of wetland and upland habitat areas on site. Failure to implement the proposed project would result in the continuation of the lagoon's degraded condition and would not resolve the current issues, including poor circulation and water quality, eutrophication, sedimentation, diminished quality of aquatic and riparian habitat, and loss of ecologically valuable habitat.

Overall, the proposed project is expected to benefit sensitive avian populations and populations of other sensitive species over the long-term, but would result in temporary impacts during construction. The long-term benefits of this project are discussed in the November 8, 2016 memorandum prepared by the Commission's ecologist, Dr. Laurie Koteen (hereinafter "Dr. Koteen Memorandum"), which is incorporated as if set forth in full herein (Exhibit 7). Thus, the Commission finds that there is no less environmentally-damaging alternative.

Section 30233 requires that adequate mitigation measures to minimize adverse environmental impacts of the project be provided. The applicant has incorporated numerous mitigation measures in the proposal, as required by the Final Environmental Impact Report (FEIR) including the proposed restoration plan described above. **Special Condition No. 1** requires additional monitoring and reporting to determine the success of the restoration efforts on lagoon physical hydrology, revegetation, aquatic, and terrestrial species and requires corrective action if results indicate that the lagoon is not functioning as expected and success criteria are not met.

Additional special conditions require BMPs to prevent erosion or the introduction of pollutants into the lagoon during construction. Therefore, the Commission finds that, as conditioned, the project will provide adequate mitigation measures to minimize adverse impacts on habitat values and no net loss of wetland area or function will occur as a result, as required by Section 30233(c).

Finally, Section 30233(b) requires that any dredge spoils suitable for beach replenishment be used as such. In this case, the clean sand excavated to create the overdredge pit has been tested and determined suitable for beneficial reuse at local beaches as well as longshore current systems. While a portion of the sand will be placed and stored off-shore at the SO-6 sites, that sand will be available for potential future beach nourishment projects. Thus, the proposed project is consistent with Section 30233(b). Additional dredged materials will be used on-site to create transition areas and an avian nesting area.

Due to the reasons discussed above, the Commission finds that the proposed project, as conditioned, is consistent with Section 30233 of the Coastal Act.

D. WATER QUALITY

Section 30231 of the Coastal Act states:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30231 of the Coastal Act requires that the biological productivity and quality of coastal waters be maintained and, where feasible, restored. In this case, the proposed development is the restoration of the San Elijo Lagoon, a lagoon system that is characterized by poor water quality. The lagoon's impaired water quality can be attributed to historical waste water sludge disposal; urbanization of the surrounding watershed and associated chemical, nutrient and fine sediment deposition; and a constrained lagoon basin architecture as a result of the historical construction of transit corridors that cut across the lagoon and highly impede water flow. San Elijo Lagoon is listed as a 303d impaired water body under the Clean Water Act due in large part to the frequency, severity and duration of eutrophic events. Eutrophication is characterized by very low dissolved oxygen (DO) levels throughout the lagoon; conditions which lead directly to fish kills, and which impair the benthic habitat that supports the entire lagoon food web.[3] In addition

[3] Yang, X.-e., Wu, X., Hao, H.-l. & He, Z.-l. Mechanisms and assessment of water eutrophication. *Journal of Zhejiang University. Science. B* **9**, 197-209, doi:10.1631/jzus.B0710626 (2008)

to problems with eutrophication, San Elijo Lagoon is 303d listed as sediment impaired. Sedimentation in San Elijo Lagoon is a function of several factors, but is largely related to the constrained water circulation patterns which increases the deposition of fine sediment within the lagoon.

The proposed project is expected, in the long-term, to significantly improve the circulation of the lagoon in order to increase water movement, water quality, and the long-term biological productivity of coastal waters. The project is also expected to remove high nutrient sediment that has continued to impact water quality in the lagoon. The long-term water quality benefits of this project are discussed in the Dr. Koteen Memorandum (Exhibit 7), which is incorporated as if set forth in full herein. Specifically, water stagnation, prolonged freshwater drainage and a muted tidal prism are major causes of the eutrophic conditions and increased sedimentation that commonly occur in San Elijo Lagoon. Widening and deepening the tidal inlet and the bridge opening beneath the I-5 bridge (as a part of the Caltrans project to replace the I-5 bridge over San Elijo Lagoon that has been coordinated to occur concurrent with the subject project), removing the weir in the east basin, and dredging to increase and extend tidal channels will expand the width, reach, and connectivity of tidal channels within the lagoon and ultimately increase the renewal of water throughout the system and decrease sedimentation and eutrophic events in the lagoon. In San Elijo Lagoon, the residence time[4] indicates the amount of time required for hydraulic flushing by tidal waters. The proposed project would decrease the existing east basin water residence time from 15 days to a maximum of 7.6 days and improve the ability to move sediment through the lagoon. With a target residence time of seven days generally viewed as indicative of good circulation in Southern California wetlands,[5] the project nearly achieves that objective lagoon-wide.

Dredging will serve to remove legacy nutrients discharged for decades into the lagoon from a wastewater treatment plant. This high nutrient sediment will be buried in the overdredge pit on-site which will be capped with clean sediment, thus sequestering the nutrients in the pit. These nutrients contribute to the algal blooms which fuel eutrophication, and their removal is a critical piece in improving lagoon water quality overall.

In order to ensure that the lagoon restoration is successful in improving water quality, **Special Condition No. 1** requires the applicant to submit and implement a Final Wetland Habitat and Hydrology Monitoring Plan that sets data collection and analysis requirements, performance standards, and methods of determining hydrological success of the project. Special Condition No. 1 further requires that the applicant submit monitoring reports to the Executive Director, and requires a revised restoration program to be submitted if the initial report shows that restoration has not been successful.

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[4] Residence time can be conceptualized as the length of time a given water molecule is resident within a specific location of the lagoon.

[5] Moffat and Nichol, Moffat and Nichol, San Elijo Lagoon Water Quality Study, 2012.

During construction, coastal waters, including in the lagoon, the nearshore ocean adjacent to Cardiff State Beach and Fletcher Cove, and at the SO-6 sites, could be temporarily impacted through the unintentional introduction of sediment, debris, or chemicals with hazardous properties. To ensure that construction material, debris, or other waste associated with project activities does not enter the water, **Special Condition No. 13** requires the applicant to submit a Construction and Pollution Prevention Plan for review and approval of the Executive Director that includes BMPs to minimize erosion and sediment discharge and the discharge of construction pollutants. Therefore, the Commission finds that the project, as conditioned, is consistent with Section 30231 of the Coastal Act.

E. ENVIRONMENTALLY SENSITIVE HABITAT AREAS AND MARINE RESOURCES

Section 30230 of the Coastal Act states:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act states:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges- and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30233 of the Coastal Act states that:

> *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*
>
> > *(l) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
> >
> > *(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(5) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(7) Restoration purposes.

(8) Nature study, aquaculture, or similar resource dependent activities.

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the l9 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division. […]

(d) Erosion control and flood control facilities constructed on water courses can impede the movement of sediment and nutrients which would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, whenever feasible, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects. Aspects that shall be considered before issuing a coastal

> *development permit for such purposes are the method of placement, time of year of placement, and sensitivity of the placement area.*

Section 30240 of the Coastal Act states:

> *(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.*
>
> *(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

Section 30107.5 of the Coastal Act states:

> *"Environmentally sensitive area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.*

In addition, the following City of Encinitas LUP policies relate specifically to protection of environmentally sensitive habitat and marine resources:

> *POLICY 1.4: Establish a balance of natural open space and "improved" recreational open space and implement measures to preserve, and maintain the natural environment.*
>
> *POLICY 8.1: Ban the possession and use of materials or articles on beaches, lagoons, and in City parks which are hazardous to wildlife.*

Section 30231 of the Coastal Act requires that the biological productivity and quality of coastal waters be maintained and, where feasible, restored. Section 30230 requires that uses of the marine environment be carried out in a manner that will sustain the biological productivity of coastal waters and maintain healthy populations of all species of marine organisms. In addition, Section 30240 of the Coastal Act requires that environmentally sensitive habitat areas (ESHAs) be protected and that development within or adjacent to such areas is designed to prevent impacts which could degrade those resources.

LAGOON RESTORATION

The San Elijo Lagoon contains important biological resources and provides habitats for many plant and animal species. The lagoon and adjacent uplands contain over 400 species of plants, over 20 species of fish, over 20 species of reptiles and amphibians, 24 species of mammals, over 295 bird species (including 65 that nest in the lagoon), and a variety of terrestrial and marine invertebrates. Included are six federally threatened and endangered birds, one federally listed plant species, one state-listed plant species, and 20 additional special status plant species. Although San Elijo Lagoon is degraded due to poor water quality, it still provides habitat for

these sensitive species and is considered ESHA. These species may potentially be located, at times, within or near the project area and could be adversely impacted by the project, as described in detail below:

Plant Species

No federally or state-listed rare, threatened, or endangered plant species occur within the areas proposed for restoration. The lagoon contains one federally listed plant species (Del Mar manzanita) and one state-listed species (Orcutt's goldenbush); however, both occur in upland habitat and would not be affected by the proposed project. One plant, southwestern spiny rush, is listed as rare by the California Native Plant Society and would be directly impacted by grading. However, there are several hundred southwestern spiny rush individuals scattered throughout the mid- and high-salt marsh habitats within the lagoon, and impacts would only occur to approximately 11 individual plants, avoiding a significant disruption of the habitat. Thus, the southwestern spiny rush is expected to persist in the lagoon during and following restoration.

Vegetation Communities

Sixteen vegetation communities and three cover types were mapped at the lagoon during 2010 and 2012 field surveys. Vegetation communities include: coastal brackish marsh, high-, mid-, and low-littoral zone coastal salt marsh, disturbed wetland, open water, saltpan/open water, sandbar willow scrub, southern willow scrub, tidal mudflat/open water, coyote bush scrub, Diegan coastal sage scrub, Diegan coastal sage scrub/chaparral, eucalyptus woodland, and nonnative grassland (Exhibit 8). The proposed project would result in impacts to sensitive vegetation communities including temporary impacts during construction and permanent (and intentional) impacts to the habitat mix in the lagoon following construction.

Short term, approximately 133.2 acres of habitat would be affected by grading and 19.4 acres would be subject to inundation during construction (Exhibit 9); however, the lagoon is anticipated to fully recover 5–10 years post-restoration as vegetation in the lagoon reestablishes at new elevations, resulting in a highly functioning ecosystem. Specifically, the proposed project would increase subtidal habitat, low-marsh, and mudflat, and would create transitional wetland to upland habitat. Most of the increase in open water tidal channels and mudflat habitat would occur in the central and east basins, and would result in a corresponding decrease in mid-marsh, saltpan, and freshwater or brackish marsh habitats (Exhibit 10). Because the habitat conditions within San Elijo Lagoon are primarily a result of elevation and hydrology, long-term changes to habitat composition are not only expected but are important goals of this project.

In a preliminary revegetation plan submitted to the Commission, the applicant proposes to collect seeds and cuttings and salvage native plants prior to construction for use and planting after grading. Cuttings and seeds would be used to propagate plants prior to construction activities in each basin, and select individual seeds would be hand planted. The proposed plant palette and seed mix are designed to supplement naturally recruiting species and focus on increasing species diversity and the rate of native plant cover and development.

Revegetation would take place in upland, transitional, and low-, mid-, and high marsh vegetation communities. Restored low-marsh areas would be planted exclusively with California cordgrass salvaged from areas impacted during construction. Pacific pickleweed (*Salicornia pacifica*) is expected to naturally recruit into impacted areas, however, this species may be added to the plant

palette later and installed in limited numbers if natural recruitment does not occur as readily as expected. Various native plants would also be installed in the upland, mid- and high-marsh habitats, and native seed collected within the lagoon would be applied by hand to high-marsh and transitional areas.

Should sediment, debris, or chemicals be introduced as a result of project activities, the adjacent sensitive vegetation communities could be adversely impacted. To ensure that construction material, debris, or other waste is properly contained and does not enter the water or sensitive lagoon habitat, **Special Condition No. 13** requires the applicant to submit a construction and pollution prevention plan for review and approval of the Executive Director.

Furthermore, the use of herbicides in open water could adversely impact the riparian habitat and water quality in the lagoon. **Special Condition No. 2** requires that herbicides, if necessary for revegetation, not be used in any open water areas. Herbicide use in upland areas shall be restricted to the use of HabitatTM (Imazapyr) herbicide for the elimination of non-native and invasive vegetation for purposes of habitat restoration only.

Finally, **Special Condition No. 19** requires that the applicant provide evidence of obtaining all other State and Federal permits that may be necessary for all aspects of the proposed project because the proposed project includes work within wetlands and tidally influenced areas.

Essential Fish Habitat

While the lagoon supports several marine, freshwater, and brackish water species of fish, no special status species were reported in the Biological Resources Technical Report. However, Essential fish habitat (EFH) is designated within the project area. EFH is identified for species managed in Fishery Management Plans under the Magnuson-Stevens Fishery Conservation and Management Act and defined as those "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Construction would result in temporary impacts to EFH during grading and dredging operations, which would include excavation, turbidity, and sediment disruption. Mitigation for these impacts is proposed and detailed in Finding IV.D (Water Quality), above, and generally consists of the improved hydraulic connectivity that would occur in the lagoon resulting in enhanced conditions for a broader range of fish species. The project would be phased to allow for areas of habitat to be retained as refuge, and impacts would only occur to soft-bottom habitat, which is anticipated to recover quickly.

Long term, the proposed project would create additional areas of open water and mudflat habitat, as well as enhance the conditions of existing subtidal habitat by increasing tidal influence within the lagoon. This increased habitat would support local fish populations and benefit EFH within the project area. No significant adverse impacts to EFH are anticipated.

Sensitive Avian Species

Of the 94 special-status species determined to have some potential to occur in the project area, six species listed as federally or state threatened or endangered were detected on-site during previous studies, and are considered resident or breeding within the project area: Ridgway's rail, western snowy plover, California least tern, southwestern willow flycatcher, least Bell's vireo, coastal California gnatcatcher and Belding's Savannah sparrow.

Ridgeway's Rail

Ridgway's rail (*Rallus longirostris obsoletus*; rail), previously known as the California Clapper rail, was listed as federally endangered in 1970 and listed on the California endangered species list in 1971. Although critical habitat has not been designated for the Ridgeway's rail, it is a fully protected species under California law. Their decline has been primarily due to loss of habitat, however, the birds are also susceptible to predators as they prefer to walk or swim over flying. Beginning in 2004, rails bred in captivity were successfully released into the lagoon, and in 2016 the population included 70 pairs in total (Exhibit 11).

In the San Elijo Lagoon, Ridgeway's rails nest in low- and brackish marsh and forage in mudflats, mid-marsh, and high-marsh. The proposed project would result in temporary and permanent impact to rails and their habitat from grading and inundation during construction. These impacts would affect both the low-marsh and brackish marsh habitats that support the rails.

The proposed project has been modified several times to minimize impacts to the rails. Specifically, the FEIR identified a preferred alternative that was reduced (Alternative 1B-Refined) in order to further minimize impacts to rail habitat. The reduced project includes some narrowed channel widths and the elimination of a channel in the east basin; reduced upland transitional areas in the central and east basins; and the elimination of selected areas of shallow grading/dredging in the central and west basins, thereby retaining existing habitat at those locations. This alternative also includes a reduction in the size of the overdredge pit to a smaller footprint with steeper slopes and less associated material for beneficial reuse. Construction methods are also modified to reduce the area of inundation (in both extent and duration). Most recently, the applicant revised the project to reduce channel dredging in the central basin in order to decrease the project's impacts to low marsh.

These changes have taken place after considerable coordination with the Commission and the U.S. Fish and Wildlife Service, as well as the following resource agencies: U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration, California Department of Fish and Wildlife, Regional Water Quality Control Board, and the Coastal Conservancy. Thus, the impacts to Ridgway's rails have been minimized to the greatest extent feasible.

California Least Tern

The California least tern (*Sterna antillarum browni*; tern) was listed as federally endangered in 1970 and a state endangered species in 1971. Although critical habitat has not been designated for the California least tern, it is a fully protected species under California law. At the time of federal listing, only 600 breeding pairs were identified; however, the population has since grown to approximately 7,100 pairs, documented in 2005.[6]

California least terns nest on flat sandy beaches that are relatively secluded from disturbance and predation. Near-shore ocean waters and shallow estuaries serve as foraging habitat. Repeated

[6]Species Information, California Least Tern. Assessed on November 10, 2016. Available at: https://www.fws.gov/sacramento/es_species/Accounts/Birds/es_ca-least-tern.htm.

disturbance of breeding sites can have significant effects on California least tern reproductive success and can cause nest failure, re-nesting, and site abandonment.

While California least terns have been documented annually foraging in subtidal channels and open water within the San Elijo Lagoon, the bird has not successfully nested at the lagoon in over ten years. During construction, impacts to the least terns' foraging habitat would occur; however impacts would be short-term and would follow a phased approach, with dredging occurring in each of the three lagoon basins consecutively. Work will also be phased within each basin, so that large contiguous areas of foraging habitat would remain throughout construction.

Permanent changes to foraging and nesting habitat will benefit the terns following construction as lagoon conditions improve. Specifically, higher productivity in the restored subtidal habitat will directly benefit foraging terns, as well as the creation of two-acres of nesting habitat in the central basin.

Western Snowy Plover

The western snowy plover *(Charadrius nivosus nivosus)* is federally listed under the Endangered Species Act of 1973 as threatened, and listed as a Bird Species of Special Concern in California. In 2012, the USFWS designated 3 subunits of land totaling 15 acres in the San Elijo Lagoon as critical habitat for the western snowy plover. Federal Register Vol. 77, No. 118 notes the planned restoration and states, *[t]hese subunits contain the physical or biological features essential to the conservation of the species, including sandy beaches and tidally influenced estuarine mud flats with tide-cast organic debris supporting small invertebrates. Restoration of degraded habitat within these subunits will improve the habitat.*

While western snowy plover have been documented annually foraging on mudflats and roosting at San Elijo Lagoon, the bird has not successfully nested at the lagoon in over ten years. Impacts to foraging habitat would occur during construction; however, as noted above, these impacts would be phased across the three lagoon basins, so that foraging habitat would remain available throughout the construction period.

Long-term benefits are expected as lagoon conditions improve. Specifically, the improved conditions would enhance the benthic community in the restored mudflats, result in higher productivity, and have direct benefits to birds that forage on them, including the western snowy plover. The project would also improve nesting through the creation of two acres of nesting habitat in the central basin suitable for Western snowy plovers.

Least Bell's Vireo and Southwestern Willow Flycatcher

Least Bell's Vireo (*Vireo bellii pusillus*) was listed as federally endangered in 1986 and listed on the California endangered species list in 1980. The Southwestern willow flycatcher (*Empidonax traillii extimus*) was listed as federally endangered in 1995 and is currently a candidate for the California endangered species list. While critical habitat has been designated for both birds, none occurs in the San Elijo Lagoon.

The Least Bell's Vireo and Southwestern Willow Flycatcher have both been observed in low numbers nesting and foraging primarily within the southern willow scrub habitat. Approximately 2 acres (3% of total habitat within lagoon) of this habitat will be impacted during construction as

a result of grading. Vegetation would be removed outside of the breeding season to avoid impacts to the foraging birds. The impacts to the southern willow scrub riparian habitat would not be substantial and are not expected to result in a decline in the local population below self-sustaining levels.

Coastal California Gnatcatcher

The Coastal California gnatcatcher (*Polioptila californica californica;* gnatcatcher) is listed as federally threatened. Critical habitat for the gnatcatcher has been designated in the lagoon. Coastal California gnatcatchers are observed along the periphery of San Elijo Lagoon within the sage scrub and chaparral habitats. Coastal California gnatcatcher critical habitat would not be significantly impacted during construction, however, there are two areas where critical habitat exists in the vicinity of proposed grading and inundation. One of these areas is mapped near the existing access road proposed to be improved, and a second area is mapped along the I-5 berm where the bridge is proposed to be widened by Caltrans as part of the I-5 North Coast Corridor Project. In the area of the existing access road, provisions to avoid impacts to critical habitat would be implemented by confining construction activities to within the existing roadbed and disturbed areas. Impacts to critical habitat in the area of the I-5 North Coast Corridor Project were considered and mitigated in advance as a part of that highway project (CDP 6-15-2092/NOID NCC-NOID-0005-15). No additional impacts to gnatcatcher critical habitat are expected to occur in this area.

Belding's Savannah Sparrow

The Belding's Savannah sparrow, *Passerculus sandwichensis beldingi*; is listed as state-endangered. This bird resides in the coastal salt marshes of Southern California year-round. Belding's are ecologically associated with dense pickleweed, and most nests are found within that habitat.

During construction, approximately 20% of the Belding's suitable nesting habitat will be impacted. In addition, the project will impact 49% of low-marsh habitat, an important foraging habitat for the Belding's. Post restoration, there will be a decrease of approximately 12% of the Belding's existing 261 acres of suitable nesting habitat. However, low-marsh will greatly increase as a result of the project, from the existing 13 acres to almost 36 acres. In conclusion, while there will be short-term impacts to the Belding's foraging habitat during construction, long-term benefits to foraging habitat will be realized following restoration. In addition, the project will cause both temporary and permanent decreases to the Belding's nesting habitat in the lagoon.

Lagoon Restoration Monitoring

The applicant has submitted a draft physical and biological monitoring plan to monitor the success of the lagoon restoration. The plan proposes to monitor biological habitats, including the tidal inlet, intertidal mudflat, intertidal salt and brackish marsh, and transitional habitats; biological processes, including benthic macroinvertebrates, fish, birds and vascular plants and algal cover; and physical processes including topography, bathymetry, tidal amplitude, water quality and soils. Where applicable, the monitoring plan utilizes the sampling and analysis methods used by University of California, Santa Barbara (UCSB) biologists under contract to the

California Coastal Commission (CCC) for the design and monitoring of the San Dieguito Lagoon Restoration project. The San Dieguito restoration, which is geographically near to San Elijo Lagoon, was constructed as a mitigation wetland for the San Onofre Nuclear Generating Station (SONGS) by Southern California Edison. By employing similar methods and measuring similar variables to the San Dieguito Lagoon Restoration, the restored wetland and its associated reference sites can serve as reference sites for the San Elijo Lagoon restoration.

In order to ensure that the restoration and monitoring are adequately implemented, **Special Condition No. 1** requires a Final Lagoon Monitoring Plan to be submitted to the Executive Director that substantially conforms to the draft monitoring plan submitted to the Commission. However, the draft monitoring plan proposed by the applicant included a 5-year monitoring period. The NCC PWP/TREP states that monitoring for the lagoon restoration shall be conducted for a 10-year period for tidal wetlands and, as such, Special Condition No. 1 further requires that monitoring be conducted for the 10-year term.

The draft monitoring plan also lacked specificity in regards to monitoring requirements and performance standards. **Special Condition No. 1** requires that the Final Lagoon Monitoring Plan include specific monitoring requirements and performance standards with which to measure if restoration goals are achieved. Also lacking are specific triggers that would spur remedial action if monitoring indicates conditions are not achieving project objectives.

In the absence of statistical rigor in monitoring programs, the ability to assess potential impacts and require mitigation for them has been severely limited due to inconclusive results. Much of this may have been avoided had the monitoring programs been adequately designed to have sufficient statistical power and thus, an ability to fairly assess project impacts. As such, **Special Condition No. 1** requires that the response variables used to assess the relative performance standards of the SELRP (hereafter referred to as "relative performance variables") be similar to those of the reference wetland habitats. Evaluating whether a particular relative performance variable (e.g., benthic macroinvertebrate diversity) at the SELRP is similar to the reference wetlands requires that the mean value for the performance variable at the San Elijo Lagoon wetlands not be significantly worse than the mean value at the worst performing reference wetland[7]. An additional central part of the analysis shall analyze and describe differences

[7] The standard one sample, one tailed approach shall be used to evaluate all such comparisons. Significance is determined using an approach that utilizes both a formal probability value and an effect size. Generally this is done by means of a t-test. The performance for a particular relative performance variable at San Elijo Lagoon is considered to be worse than the lower of the reference wetlands if the p-value for the comparison is ≤ the proportional effect size (i.e., the proportional difference between San Elijo Lagoon habitats and the worst performing reference wetland). The only exception to this rule is when the p-value and the proportional effect size are both greater than 0.5, in which case assessment for the period is considered inconclusive and additional studies shall be done. The rationale for using the mean value of the worst performing of the reference wetlands is that the reference wetlands are considered to be acceptable measures of comparison for the San Elijo Lagoon wetland habitats. Hence if the San Elijo Lagoon Restoration is performing at least as well as one of the reference wetlands, then it should be judged successful. The scaling of the p-value (α) to the effect size recognizes sampling error when estimating mean values and balances the probability of falsely concluding that the San Elijo Lagoon Restoration is not similar to the reference wetlands when it is (Type I error) with the probability of falsely concluding that the San Elijo Restoration is not similar to the reference wetlands when it is not (Type II error).

between the baseline conditions and the post-restoration conditions, and specifically how these changes conform to project goals as laid out in the project objectives section 1.2 of the FEIR.

A reduction in the tidal prism of the restored wetland can have detrimental effects on water quality and alter the area of inundated habitat. Following restoration, the tidal prism in the lagoon will increase. However, any predictions describing the new tidal prism are likely to differ from actual values for the as-built wetland since the actual as-built topography will not precisely mimic the planned conditions. Therefore, **Special Condition No. 1** requires that the tidal prism of the restored wetland be calculated from empirical measurements on completion of construction and used as the standard of comparison to detect changes in this performance variable during subsequent monitoring. Since tidal prism can influence the area of planned wetland habitat reached by the tides, the tidal prism standard is evaluated, in part, using criteria set forth in the habitat area standard, which provides that the areas of the different habitats (subtidal, intertidal mudflat, vegetated salt marsh) shall not vary by more than 10%.

Specifically, the performance standards will be developed to ensure:

- The lagoon system will not undergo major topographic degradation (such as excessive erosion or sedimentation) and will maintain a specified final wetland acreage amount for each habitat type, (*e.g.* low, mid and high marsh), and tidal elevation within 10 percent of initial habitat objectives.
- Water quality variables, including, at a minimum, dissolved oxygen, seasonal percentage of eutrophic conditions, and turbidity, will be evaluated through comparison with reference wetlands or aquatic habitat and relative to baseline conditions.
- The designed tidal prism will be achieved and maintained for all lagoon basins, and tidal flushing will not be interrupted.
- Within five years of restoration, community composition and the total densities and number of species of fish, macroinvertebrates and birds will be similar to that in similar habitats in the reference wetlands.
- The proportion of total vegetative cover and open space and plant species diversity in each habitat type will be similar to those proportions and diversity found in the reference sites in both planted and unplanted habitat types upon project completion. The percentage cover of algae will be similar to the percent cover found in the reference sites.
- Among wetland locations that achieve the salinity levels and elevations to support native spartina (cordgrass), or which supported spartina prior to restoration, the restored wetland areas shall have a canopy architecture that is similar in distribution to the reference sites, with an equivalent proportion of stems over 3 feet tall 5 years following restoration.
- The food chain support provided to birds will be similar to that provided by the reference sites, as determined by their feeding activity.
- The important functions of the wetland will not be impaired by exotic species, including 0 percent coverage, will be maintained for California Invasive Plant Council's "Invasive Plant Inventory" species, and no more than 5 percent coverage for other exotic/weed species.

Final success criteria will be developed for each habitat type and for all physical and chemical parameters and the Final Lagoon Monitoring Plan shall detail the method by which success of the restoration will be judged. Moreover, **Special Condition No. 1** requires that a final detailed report on the habitat restoration be submitted for the review and written approval of the Executive Director. If the report indicates that the habitat restoration has, in part, or in whole, been unsuccessful based on the success criteria and performance standards specified in the monitoring program, Special Condition No. 1 further requires that the applicant submit a revised or supplemental restoration plan to compensate for those portions of the original plan which did not meet the approved performance standards. This plan shall be implemented in a period not to exceed 90 days following approval of the plan by the Executive Director, unless an extension is approved or an amendment is required.

Construction Measures

The applicant proposes that a biological monitor be present during project activities to avoid and minimize impacts to sensitive species during construction. Vegetation clearing, grubbing and inundation will be conducted outside of breeding season. To encourage the movement of birds to areas of refugia, the biological monitor will walk along the impacted habitat ahead of machinery in an effort to flush birds and other wildlife from these areas during dry conditions. If clearing and grubbing activities occur in inundated areas, these areas will be inundated for at least 24 hours prior to implementation in order to actively encourage wildlife to relocate from vegetation proposed to be cleared to adjacent non-impacted habitat. Grubbing of vegetation will occur while vegetation is still inundated to minimize the likelihood of contacting marsh birds. Finally, active construction will be limited to two basins at a time, with dredging occurring in only a single basin, so that large areas of refugia will remain available for wildlife relocation.

Indirect Impacts

The proposed project may also result in indirect impacts to sensitive species during construction, including increased exposure to predators, degraded water quality, disturbed unconsolidated sediment, lighting, and noise.

Ridgway's rail and Belding's savannah sparrow may be at an increased risk from predators during construction as restoration activities would encourage concentration of species in the remaining un-impacted areas. To reduce this risk, perches that provide roost locations for predatory avian species will be removed or fitted with anti-perching devices to minimize predation and encourage nesting.

In addition, sensitive birds may also be exposed to degraded water quality from dredging and other sediment-disturbing activities. These activities may increase turbidity and the presence of unconsolidated sediments, which could lower visibility and make foraging more difficult. However, these impacts would occur relatively close to the active dredging and other construction activities and would dissipate with distance. Because the dredge is slow moving, impacts would be isolated to discrete areas on any given day, leaving many areas within the working basin still suitable for foraging. In addition, the project is phased such that work will occur in a maximum of two basins at a time, leaving the other basins not under active construction available for foraging activities.

The applicant proposes to conduct dredging operations 24 hours a day for the construction of the overdrege pit which will require some night lighting where the dredge is operating. The FEIR requires that lighting be shielded and directed away from sensitive lagoon areas where sensitive species may be located. In order to protect biological resources within the lagoon, **Special Condition No. 16** requires that the applicant submit a Construction Lighting Plan that uses applicable technologies designed to reduce night glow and light trespass, minimizes the number of lights, and uses the minimum level of illumination necessary to light the construction area for operations and safety.

Finally, the proposed project may result in noise impacts to sensitive avian species from construction equipment and activity. Species that occupy habitat at the lagoon edge, or outside the impact footprint, would be less affected by noise than those that occur within the impact footprint. These edge species include least Bell's vireo, southwestern willow flycatcher, and coastal California gnatcatcher. Other sensitive birds, including Belding's savannah sparrow and light-footed Ridgway's rail, currently forage and breed throughout the lagoon.

Ambient noise levels in San Elijo Lagoon are moderate to high for a natural system due to the multiple transportation corridors that border and traverse it, including the LOSSAN rail corridor, I-5 corridor, Coast Highway 101 to the west, and Manchester Avenue to the north, and species have adapted to these elevated noise levels. However, the addition of a dredge and other construction equipment would increase ambient noise levels further. Currently, noise levels for the dredge are estimated at 73 dBA CNL[8] at 50 feet and 67 dBA CNL at 100 feet. Other construction equipment may reach maximum noise levels of 80 dBA at 50 feet (for most equipment), but use of these types of large equipment is anticipated to be localized to areas that support dry construction (i.e., along the access road, CDFW dike, utility corridor, and nesting area). When in proximity to wildlife, the effects of the dredge and other construction noise could result in modified foraging or breeding behavior. The greatest impact from noise would occur within the first 200 feet of equipment and would dissipate exponentially with distance. For example, one piece of equipment that generates a maximum noise level of 80 dBA at 50 feet (typically with a usage factor of 40 percent; i.e., fraction of time that the equipment is operated at full power) would have produced noise attenuate to 60 dBA Leq (Equivalent Continuous Sound Level) at 240 feet from the source. Noise impacts would be more pronounced within the quieter areas of the lagoon as opposed to the louder areas near roads and the railroad. The movement of construction activities and the distribution and mobility of wildlife make minimizing the effects of noise with attenuating devices virtually impossible. However, the dredge is slow moving and the applicant has proposed to conduct dredging in one basin at a time (other types of construction may take place in a second basin); therefore, quieter habitat would always be available for birds and other wildlife to relocate to.

However, relocation during the breeding season is not feasible for nesting birds. Completely avoiding construction during the breeding season was evaluated as part of the development process for this project, which included participation by the resource agencies. However, as

[8] CNL or Community Noise Level is used to evaluate noise impacts. Community noise levels are measured in terms of the A-weighted decibel (dBA).

avoiding the breeding season would almost double the length of construction, this extended temporal impact could pose a larger impact to resident marsh birds, including the Ridgway's rail and Belding's savannah sparrow. As such, the FEIR concluded that contiguous construction phased across basins would minimize overall noise impacts to sensitive species.

MATERIAL PLACEMENT AT BEACHES AND OFF-SHORE BORROW SITES

Restoration of San Elijo Lagoon will generate approximately 850,000 cubic yards of excess sediment through creation of an overdredge pit in the central basin, which will provide beach quality sand for beach replenishment and offshore placement while accommodating the disposal of nutrient-laden material onsite. Sediment originating from the surrounding watershed has gradually accumulated in the lagoon due to a variety of anthropogenic manipulations (*e.g.*, bridges, revetments), and become inadvertently restricted from its natural progression to the ocean environment. Consequently, the lagoon's capacity, and biological and hydrologic functions, have become severely limited while the onshore and nearshore environments have been deprived of the sediment that would normally feed these systems. Sand excavated from the overdredge pit is proposed to be placed in four different locations just outside of San Elijo Lagoon, into the environment it would have been expected to reach had humans not manipulated this coastal system.

The onshore and offshore sand placement sites all occur within the Oceanside Littoral Cell, which is bounded by Dana Point to the north and the La Jolla Submarine Canyon to the south – San Elijo Lagoon sits within the lower half of this 52-mile cell. The general alongshore current direction in this area is southward. Placing excess lagoon sediment into the local littoral cell is appropriate because the shoreline in San Diego County has been undergoing net erosion. Over the last several decades the rate of sand loss to deep offshore water and submarine canyons has greatly exceeded the amount of new sand delivered to the beaches.[9] As a result, most San Diego beaches are either receding, or have disappeared altogether. The proposed placement sites are Cardiff State Beach, Fletcher Cove, and two offshore borrow pits that were used as sand sources for Regional Beach Sand Projects (RBSP) I and II and that are intended to be used again for future replenishment activities. Following are the sand quantities proposed for each placement site:

- Cardiff State Beach – 300,000 cubic yards (cy)
- Fletcher Cove – 146,000 cy
- SO-6 RBSP I (2001) – 107,000 cy
- SO-6 RBSP II (2012) – 297,000 cy

Transport of the sand from San Elijo Lagoon to the off-site locations is proposed to occur through pipelines extending from the lagoon, through the lagoon inlet, and to the placement sites.

[9] Surfrider Foundation, San Diego Chapter (Jim Jaffee and Mike Weinberg). 2007. Dynamics of Beaches Made Easy. 10pgs.

A booster pump may be necessary to help convey material directly from the overdredge pit to the placement sites through the dredge pipeline. The volume of sand slated for the offshore sites would be no larger than the volume that was previously removed by RBSP I in 2001 and RBSP II in 2012. Sand piped to the two receiver beaches will be discharged behind a training dike and allowed to settle from the water/slurry. Once it has settled, it will be spread along the beach using bulldozers.

The sensitive marine ecosystems in and immediately adjacent to the proposed beach replenishment footprints include sandy beach, rocky intertidal supporting surfgrass beds and subtidal rocky reefs supporting kelp beds and understory algae. While these ecosystems are treated separately here, they comprise a vital transition zone interconnected by complex physical and biological interactions that occur across variable spatial and temporal scales, and that inexorably link terrestrial and marine ecosystems. While placing excess sediment from the lagoon restoration into the local littoral cell may be considered as both a beneficial re-use and a practical benefit, the sediment quantities are large and the proposed project includes placing sediment in and adjacent to an unusually rich and ecologically-valuable marine environment, a large area of which was recently incorporated into the Southern California Marine Protected Area (MPA) network. The amount of replenishment material slated for Solana Beach is the same amount placed there in 2012 during RBSP II; however, the amount slated for Cardiff State Beach is three (3) times more than the 101,000 cy placed there in 2012.

The Coastal Act requires the protection of marine resources, particularly in areas of special biological significance. Marine resources must be maintained, enhanced or restored, as required by Sections 30230 and 30231 of the Coastal Act. Section 30230 further requires that special protection be given to areas and species of special biological or economic significance. Uses of the marine environment must be carried out in a manner that will sustain the biological productivity of coastal waters. The biological productivity and the quality of coastal waters appropriate to maintain optimum populations of marine organisms and for the protection of human health must also be maintained. Development in areas adjacent to sensitive marine habitat areas, marine parks, sensitive habitats protected by federal or state laws, MPAs, and recreation areas, must be sited and designed to prevent adverse impacts to the greatest extent possible. Certain types of development are allowed in open coastal waters where there is no feasible less environmentally-damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects.

Section 30233 of the Coastal Act allows mineral extraction, including sand for restoring beaches in coastal waters, except in environmentally sensitive areas. Additionally, the material removed from erosion and flood control facilities on streams may be placed at appropriate points on the shoreline. While the Coastal Act does not specifically provide for the placement of sand from other sources, the Commission has consistently interpreted the restoration of beaches to be a permitted use in open coastal waters. In such projects, the Commission has addressed the impacts on marine resources by considering the timing of deposition of the material on the beach, the composition of the material, the location of the receiver beach, the presence of sensitive resources, and through monitoring and mitigation plans.

Therefore, several special conditions are required to ensure that the proposed project is designed and conducted in the least environmentally-damaging manner possible, and to ensure consistency with the Coastal Act.

Swami's State Marine Conservation Area

Swami's State Marine Conservation Area (SMCA) was established in January 2012 by the California Department of Fish and Wildlife (CDFW) under the Marine Life Management and Marine Life Protection Act.[10] A primary reason for establishing marine protected areas in California is the preservation and conservation of habitat and species diversity. The ecological significance of the area encompassed by the Swami's SMCA was recognized by its inclusion in the southern California Marine Protected Area (MPA) network. Great care, scrutiny, and effort went into establishing the boundaries of the MPAs within the network. Capturing representative intertidal and subtidal hard bottom habitat, which is relatively uncommon along the southern California shoreline, and is required by the MPA science guidelines, was a challenge. Swami's SMCA protects and replicates the persistent kelp forest/surfgrass habitat and associated species nearest to the Palos Verdes State Marine Reserve to the south, meeting both sizing and spacing guidelines of the network.

The Swami's SMCA is 12.71 square miles and spans 2.7 miles of shoreline, from Moonlight Beach in the north to just past San Elijo Lagoon in the south. Cardiff State Beach and both of the SO-6 offshore borrow sites are located within Swami's SMCA. The rich waters of the Swami's SMCA contain 12 distinct ecosystems including thriving kelp forests, extensive surfgrass beds, and rocky reefs where lobsters, halibut, grunion, and many other fish and invertebrates forage and breed. The specific protection provisions of the Swami's SMCA state that take of all living marine resources is prohibited except:

1. Recreational take by hook-and-line from shore.

2. Recreational take by spearfishing of white seabass and pelagic finfish.

3. Take pursuant to beach nourishment and other sediment management activities and operation and maintenance of artificial structures inside the conservation area is allowed per any required federal, state and local permits, or as otherwise authorized by the CDFW.[11]

[10] The Marine Life Protection Act (MLPA) of 1999 directs the state to redesign California's system of marine protected areas to function as a network in order to increase coherence and effectiveness in protecting the state's marine life and habitats, marine ecosystems, and marine natural heritage, as well as to improve recreational, educational, and study opportunities provided by marine ecosystems subject to minimal human disturbance.

[11] https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Network/Southern-California#27149501-swamis-state-marine-conservation-area

CDFW has concluded that use of the SO-6 sites for storage and future re-use of beach quality sediment materials from San Elijo Lagoon, is an allowable use under the Swami's SMCA (Exhibit 13). In addition, Swami's SMCA was established with the understanding that beach replenishment and sediment management activities would be allowed to continue within it, per any required federal, state and local permits, or as otherwise authorized by CDFW. However, while the Swami's SMCA regulations do allow for certain sand replenishment and other sediment management activities, significant burial of sensitive marine resources is inconsistent with the intent of this provision.

Essential Fish Habitat and Special Aquatic Sites

The nearshore marine habitats outside San Elijo Lagoon are designated as Essential Fish Habitat (EFH) under section 305(b)(6)(A) of the Magnuson-Stevens Fishery Conservation and Management Act for multiple federally managed fish species, including species within the Coastal Pelagic Species, Pacific Coast Groundfish, and Highly Migratory Species Fishery Management Plans (FMPs). Essential fish habitat (EFH) is that habitat necessary for managed fish to complete their life cycles. It is defined as those waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity. Whenever federal agencies authorize, fund, or carry out actions that may adversely impact EFH, they must consult with the National Marine Fisheries Service (NMFS).

In addition, the project occurs within the vicinity of rocky reef, surfgrass, and kelp habitat, which have been designated as habitat areas of particular concern (HAPC) for a number of federally-managed fish species within the Pacific Coast Groundfish FMP. HAPCs are described in the FMP regulations as subsets of EFH which are rare, particularly susceptible to human-induced degradation, especially ecologically-important, or located in an environmentally-stressed area. The disposal of material dredged from San Elijo Lagoon on the beach and offshore may adversely affect EFH and HAPCs by impacting or destroying benthic communities, impacting adjacent sensitive physical habitats, creating turbidity plumes, and introducing contaminants and/or nutrients to the ecosystems.

The nearshore marine ecosystems outside San Elijo Lagoon also support two of the six Special Aquatic Site types (sanctuaries/refuges, and vegetated shallows), that are given special recognition under Clean Water Act regulations.[12] Special Aquatic Sites are defined as "*Geographic areas, large or small, possessing special ecological characteristics of productivity, habitat wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region*." The Sanctuaries/Refuges designation applies to areas designated as such under state and federal laws

[12] 40 CFR Part 230 –Section 404(b)(1) EPA and ACOE Guidelines for Specification of Disposal Sites for Dredged of Fill Material (EPA and ACOE) Subpart B – Compliance With the Guidelines, Subpart D-Potential Impacts on Biological Characteristics of the Aquatic Ecosystem, Subpart E. Potential Impacts on Special Aquatic Sites, Subpart H-Actions to Minimize Adverse Effects, Subpart J-Compensatory Mitigation for Losses of Aquatic Resources.

or local ordinances, including Swami's SMCA. Vegetated shallows are defined as "… *permanently inundated areas that under normal circumstances support communities of rooted aquatic vegetation, such as turtle grass and eelgrass in estuarine or marine systems*." Surfgrass, which meets the definition of vegetated shallows under the Clean Water Act regulations for Special Aquatic Sites, occurs in rocky intertidal and shallow subtidal areas in close proximity to San Elijo Lagoon and the proposed sand-receiving sites.

Sensitive Marine Resources

Rocky Intertidal Habitat

The rocky intertidal zone is a compact and diverse area located in the transition zone between terrestrial and marine habitats. This area, exposed for part of the day and covered by water for the rest, is characterized by marine organisms adapted to varying levels of physical disturbance, temperature fluctuations, desiccation, and sand inundation, and its biological communities are influenced by interactions such as predation from both terrestrial and marine environments. In southern California, over one thousand species of algae and invertebrates inhabit this zone.[13]

Rocky intertidal habitat that supports extensive surfgrass beds occurs approximately 1,000 feet upcoast and downcoast from the proposed Cardiff State Beach replenishment footprint (Exhibit 14). Rocky intertidal at the south end of Cardiff State Beach transitions from patchy low-relief reef into high-relief reef. Low- and high-relief reefs in the mid to low intertidal, and extending offshore, occur on either side of Solana Beach (Exhibit 14). The nearest hard bottom habitat is approximately 120 feet from the proposed Solana Beach replenishment footprint. Tabletops and Tide Park reefs are to the north and support large beds of surfgrass. An intertidal to shallow subtidal reef, known as "Pill Box," also occurs on the north side of Solana Beach. These rocky intertidal areas support a diverse array of algae and sessile and motile invertebrates, including sand castle worms, sea anemones, chitons, mussels, limpets, barnacles, and sea stars.

Surfgrass (*Phyllospadix scouleri*) is a foundational species that provides important habitat for a variety of algae, invertebrates and fish. Up to 34 species of algae and 27 species of invertebrates may be associated with surfgrass along the San Diego coast.[14] Spiny lobster (*Panulirus interruptus*), valuable to both recreational and commercial fisherman, use surfgrass as nursery habitat. Surfgrass forms conspicuous beds in the rocky intertidal and shallow subtidal zones along the entire San Diego County shoreline.

[13] CDFW. 2009. Regional Profile of the MLPA South Coast Study Region (Point Conception to the California-Mexico Border). California Marine Life Protection Act Initiative.

[14] Stewart, G.J. and B. Myers. 1980. Assemblages of algae and invertebrates in Southern California Phyllospadix-dominated intertidal habitats. Aquatic Botany 9: 73-94.

Subtidal Rocky Reef Habitats

Kelp forests are underwater ecosystems typically dependent upon the availability of hard substrate to support high densities of kelp. As an ecosystem engineer, kelp is not only an important species in the biological community but it also provides unique physical structure as habitat for other species. Extensive subtidal rocky reefs occur along the stretch of coast that includes Cardiff State Beach and Fletcher Cove, which support giant kelp forests (*Macrocystis pyrifera*) as well as stands of understory algae such as the southern palm kelp (*Eisenia arborea*). Kelp forests are recognized as one of the most productive and dynamic ecosystems on earth.[15] Kelp forests provide three-dimensional structure extending through the water column, acting as physical habitat for diverse marine organisms including algae, invertebrates, and fish as well as marine mammals and birds. From the holdfasts to the surface canopies of kelp fronds, the array of micro-habitats within the kelp itself may support thousands of invertebrate individuals, including polychaetes, amphipods, decapods, and ophiuroids. Understory kelps, like surfgrass and giant kelp, are also foundational species, which provide the structural habitat for a variety of other algae, invertebrates, and fish.

Subtidal rocky reefs that support giant kelp and understory algae occur offshore to the north of San Elijo Lagoon ("Cardiff kelp bed") and south of Cardiff State Beach. The nearest hard bottom habitat is approximately 700 feet from the proposed Cardiff State Beach replenishment footprint (Exhibit 14). Subtidal rocky reefs with giant kelp and understory algae also occur offshore to the north ("Solana Beach kelp bed") and south of Fletcher Cove, where the nearest hard bottom substrate to the proposed beach replenishment footprint is approximately 120 feet away. In general, the boundaries of kelp forests and understory algae habitat that occur on subtidal rocky reefs periodically expand and contract, often responding to oceanographic conditions such as water temperature and wave regimes but also potentially affected by anthropogenic activities.

Sensitive Species

California Grunion

The California grunion (*Leuresthes tenuis*) is a sardine-sized fish endemic to the coast of California. It is unusual because it comes ashore on sandy beaches to spawn. Although grunion are not listed as threatened or endangered, NMFS requires that their eggs be protected from disturbance. California grunion have been protected and managed as a game species by the CDFW, due to their vulnerability during spawning runs. Spawning occurs from March through August, and occasionally in February and September. Peak spawning typically occurs from late March to early June. Every year the CDFW publishes and posts online the dates of the expected grunion runs. Mature grunion may spawn during successive runs, with females spawning up to six times each season. Females lay between 1,600 and 3,600 eggs during one spawn, with larger females producing more eggs. Eggs are deposited during the high tides of the month and

[15] Foster, M.S. and D.R. Schiel. 1985. The Ecology of Giant Kelp Forests in California: A Community Profile. U.S Fish & Wildlife Service. Biological Report 85 (7.2). 152pp.

incubate in the sand during the lower tides, when they will not be disturbed by wave action. The eggs are kept moist by residual water in the sand. They hatch about 10 days later, during the next high tide series, when they are inundated with sea water and agitated by rising surf.

Beach replenishment activities could bury or crush grunion eggs or change the beach profile such that juvenile grunion are unable to return to the ocean. In addition, grunion spawning behavior and grunion eggs are sensitive to light, turbidity, and disturbance. **Special Condition No. 6** requires the applicant to prepare a Grunion Monitoring and Avoidance Plan that is implemented prior to and during beach construction activities on Cardiff State Beach and Fletcher Cove to protect California grunion and their eggs. Special Condition 6 defines the protective measures that should be taken to avoid adverse impacts to grunion and grunion eggs using the Walker Scale, which defines grunion runs based on the number of fish per 300 foot segment of beach. In addition, Special Condition 6 requires the applicant to develop a list of feasible measures, taking into consideration the size of the sand receiver site, stage of mobilization, construction constraints, etc., that may be utilized to allow sand replenishment work to continue but also avoid and minimize impacts to eggs within the two week spawning period.

Western Snowy Plover

The western snowy plover (*Charadrius nivosus nivosus*), federally-listed as threatened, is known to nest at Batiquitos and San Elijo lagoons, forage along the shoreline including at Cardiff State Beach and Fletcher Cove, and overwinter on a section of Cardiff State Beach near Highway 101 north of the Seaside parking lot. To avoid impacts to western snowy plovers during beach construction activities, **Special Condition No. 4** requires that the applicant survey Cardiff State Beach and Fletcher Cove prior to any beach construction activities. If any western snowy plover are found during the survey, Special Condition No. 4 requires that the applicant coordinate with U.S. Fish and Wildlife Service to avoid any impacts to the plovers.

Beach Replenishment

While beach replenishment is often considered the most environmentally-sensitive method ("soft solution") for maintaining eroding shorelines, the ecological consequences of this practice remain poorly understood. Beach replenishment has been conducted on a large regional-scale for years in southern California with little rigorous monitoring and scientific evaluation of the direct, indirect, or cumulative ecological effects on beach and nearshore marine ecosystems.[16]

Sandy Beach Ecosystem Impacts

Despite a lack of information from California, the ecological impacts of beach replenishment on beach organisms are considered potentially severe, often resulting in 100% mortality following ecosystem burial from the initial sand placement, and often demonstrating lasting effects that

[16] Orme, A.R., J.G. Zoulas, G.B. Griggs, C.C. Grandy, D.L. Revell, & H. Koo. 2011. Beach Changes along the Southern California Coast during the 20th Century: A Comparison of Natural and Human Forcing Factors. Shore & Beach, v. 79 (4): 38-50.

extend up the food web, even to shorebirds, through time.[17,18] Furthermore, sand placed on beaches will migrate over time due to natural processes, whether gradual or episodic, and thus adjacent and downcoast ecosystems remain vulnerable to the influence of disproportionate sand inundation. The ecological impacts (including habitat conversion, alterations in diversity, abundance, and distribution) from beach replenishment projects can persist for years, particularly with respect to the recovery of important invertebrate species.[19,20] Recovery of sandy beach ecosystems following direct and indirect impacts of beach replenishment depends on the successful persistence, recolonization, and recruitment of the affected species, as well as reprieve from subsequent disturbance.

Several of the world's top beach ecologists, in a review paper on threats to sandy beach ecosystems, state the following regarding best management practices when conducting beach replenishment:

> *Mitigation of ecological impacts of nourishment is often impeded by limited data about the life history of the affected species, recovery rates and the cumulative effects of repeated nourishment events (Speybroeck et al. 2006). Nevertheless, basic management recommendations include: (1) the avoidance of sediment compaction; (2) careful timing of operations to minimize biotic impacts and enhance recovery; (3) the selection of locally appropriate techniques; (4) the implementation of several small projects rather than a single large project, including repeated application of sediment in shallow layers (<30cm) rather than single pulses that kill fauna by deep burial; (5) Interspersion of nourished beach sections with unaffected areas; and (6) importing sediments and creating beach profiles that match the original beach conditions as closely as possible.*[21]

As such, **Special Condition No. 10** mirrors many of these above practices, and requires the proposed project to incorporate, to the greatest extent feasible, the least environmentally-damaging replenishment techniques, in order to minimize direct and indirect adverse effects on the beach ecosystem.

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[17] Speybroeck, J., D. Bonte, & W. Courtens. 2006. Beach nourishment: An ecologically sound coastal defence alternative? A review. Aquatic Conservation Marine and Freshwater Ecosystems, V.16: 419–435.

[18] Peterson, C.H., M.J. Bishop, G.A. Johnson, L.M. D'Anna & L.M. Manning. 2006. Exploiting beach filling as an unaffordable experiment: Benthic intertidal impacts propagation upwards to shorebirds. Journal of Experimental Marine Biology and Ecology, V. 338: 205-221.

[19] *Ibid*.

[20] Peterson, C.H., M.J. Bishop, L.M. D'Anna, & G.A. Johnson. 2014. Multi-year persistence of beach habitat degradation from nourishment using coarse shelly sediments. Science of the Total Environment, V.487:481-492.

[21] Defeo, O., A. McLachlan, D.S. Schoeman, T.A. Schlacher, J. Dugan, A. Jones, M. Lastra, and F. Scapini. 2009. Threats to Sandy Beach Ecosystems: A Review. Estuarine, Coastal and Shelf Science, VD. 81: 1-12.

Matching the characteristics of the source sediment to the existing beach sediment is important to the ultimate recovery of the sandy beach ecosystem and preservation of the infaunal communities. In this case, the applicant has provided the draft Sampling and Analysis Plan (submitted for evaluation by the U.S. Army Corps of Engineers), which demonstrates that the sediment characteristics (*e.g.*, grain size, sand envelope, sand composition) of the sediment in the overdredge pit is very similar to that on Cardiff State Beach, Fletcher Cove, and the SO-6 sites.

Sand deposition will unavoidably result in the mortality of organisms that cannot tolerate the respective amount of sand burial and/or are not sufficiently mobile to escape the replenishment footprint as deposition commences. Damage and mortality will also inevitably occur due to contact with construction equipment and sand redistribution activities, both in and out of the replenishment footprint. These impacts will result in temporary and potentially permanent changes in the beach ecosystem (*e.g.*, species richness, abundance and distribution of infaunal invertebrates, availability of fish and bird prey population). Therefore, **Special Condition No. 5** requires five (5) years of sandy beach ecosystem monitoring, to enable a fair evaluation of the project's impacts on this sensitive marine habitat and its community, and to assess whether additional future mitigation may be necessary.

Turbidity Impacts

In addition to the direct impacts from immediate sand burial, there is also the potential for indirect impacts resulting from increased turbidity during the placement of the sand. Temporary increases in turbidity and suspended solids decrease light penetration in the water column, leading to a decline in primary productivity due to decreased photosynthesis by phytoplankton, inhibition of kelp and algae growth, and adverse impacts to marine organisms. Any appreciable turbidity increase may also cause clogging of gills and feeding apparatuses of fish and filter feeders. While turbidity is anticipated to decrease with distance from the replenishment site due to settling and dilution, it may also be influenced by tidal flushing and wave activity. These latter processes may resuspend finer sand material, particularly during large storm events. However, the immediate impacts of beach sand placement activities (*i.e.*, increased turbidity, sedimentation, dissolved oxygen reduction, burial of organisms) are expected to be relatively localized in nature and highly mobile organisms, such as fish, would likely relocate to less disturbed areas. Following sand placement activities, organisms are expected to eventually recolonize the previously disturbed areas.

The composition (*i.e.*, grain size) of the beach replenishment material also likely affects the extent and duration of turbidity plumes in the marine environment, such that finer materials will contribute to sustained turbidity; in general, the larger the fraction of coarse-grained sand, the lower the turbidity and its associated impacts. As a result, the grain size of the replenishment material is an important characteristic of the project. In this case, the replenishment material is closely matched to the native sand grain size observed at the receiving beach sites, so its behavior is expected to be similar to what is already observed in these areas; however, the placement of unusually large volumes of sand will likely increase the observed turbidity on a temporary basis. **Special Condition No. 5** addresses the heightened potential for turbidity impacts in the marine environment through inclusion of monitoring requirements to define the extent and persistence of turbidity plumes throughout each day of beach construction.

Sand Migration from Beaches to Adjacent Sensitive Marine Ecosystems

Though the project will place sand within permitted footprint areas, the sand will migrate from the beaches over time to adjacent areas where other sensitive marine ecosystems may occur. Sand movement within the Oceanside Littoral Cell, which San Elijo Lagoon and both of the beach replenishment sites are within the lower stretch of, typically runs alongshore in a southward direction, thus making downcoast areas particularly vulnerable. Sand movement may occur gradually through wave-driven redistribution, or it may occur episodically during large storm events. A recent study based on previous replenishment events in San Diego County examined the relationship between sand grain size and the retention of replenishment material at the intended beach sites, and found that coarser replenishment material remained on beaches significantly longer than where replenishment material matched the native sand grain size – at Torrey Pines, the replenishment material (matching the native sand grain size with a D50 of approximately 0.2 mm) was washed away during a single storm event.[22] Given the similarity of replenishment sand grain material for this project, the results raise concern with the episodic displacement of large sediment volumes to downcoast areas, which may result in the burial of sensitive marine resources. At the same time, there is a probable trade-off between matching the native sand grain size to benefit the sandy beach infauna communities, the trophic webs they support, and the preservation of the physical characteristics of the native beach, versus the persistence of replenishment material at receiver sites.

A primary concern regarding the proposed reuse of dredged materials for beach replenishment is the potential for indirect adverse impacts, such as burial and scour of the rocky intertidal and subtidal rocky reef ecosystems in the immediate vicinity of the receiver beaches. Very few peer-reviewed studies have been conducted on nearshore algal and invertebrate species' tolerance to sand burial. The few that have been published suggest that many species are highly sensitive to the influence of sand inundation and therefore, susceptible to lethal and sub-lethal impacts that may be imposed by the project. Research on the effect of sediment burial on surfgrass (*Phyllospadix scouleri*) showed that short-term (15-day) burial results in shoot mortality, decreased shoot counts and reduced growth.[23] A species that is often found in areas characterized by seasonal sand inundation is the aggregating anemone, *Anthopleura elegantissima.* Though aggregating anemones have been observed to resist shallow sand burial by extending their body columns so that the oral disc and tentacles reach the surface,[24] it has also

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[22] Ludka, B.C., T.W. Gallen, S.C. Crosby, and R.T. Guza. 2016. Mid-El Niño erosion at nourished and unnourished Southern California beaches. Geophysical Research Letters 43: 4510-4516.

[23] Craig, C., S.Wyllie-Echeverria, E. Carrington & D. Shafer. 2008. Short-Term Sediment Burial EffecsEffects on the Seagrass *Phyllospadix scouleri*. EMRRP Technical Notes Collection (ERDC TN-EMRRP-EI-03). Vicksburg, MS: U.S. Army Engineer Research and Development Center.

[24] O'Brian, P.Y. and M.M. Littler. 1977. Biological Features of Rocky Intertidal Communities at Coal Oil Point, Santa Barbara County, California. In: Littler M.M. (ed.) Spatial and Temporal Variations in the Distribution and Abundance of Rocky Intertidal and Tidepool Biotas in the Southern California Bight. Bureau of Land Management, U.S. Department of the Interior, Washington, D.C. pp.317-405.

been suggested that their survival when deeply buried (for three months or more) is due to body tissue metabolism and thus, there is a physiological cost and compromise in productivity.[25] Therefore, **Special Condition No. 5** requires five (5) years of rocky intertidal and subtidal rocky reef ecosystem monitoring, to be able to evaluate the project's impacts on these sensitive marine habitats and their communities. To ensure that biologically-meaningful effects are captured in the monitoring, Special Condition No. 5 further requires that intertidal and subtidal field sampling methods employed be capable of characterizing finer-scale physical structures and the biological communities of the sandy beach, rocky intertidal, and subtidal rocky reef ecosystems and be designed to discover, at minimum, a 20% change between respective impact and reference sites[26].

Offshore Borrow Sites

Previously, the two offshore SO-6 borrow sites were impacted as a part of the sand excavation to support beach replenishment activities associated with SANDAG's RBSP I in 2001 and RBSP II in 2012. According to the Marine Biological Technical Report prepared by Moffat and Nichol for the proposed project, the dredge scars at these sites remain depressed by as much as 10 to 15 feet relative to adjacent undisturbed seafloor. While it is likely that many of these benthic communities have recovered to some extent, alteration of the bathymetry at these sites has persisted, and it is probable that long-term effects on both the physical and biological conditions persist. Considering the legacy of these previous impacts, the offshore borrow sites are disturbed systems that can function as temporary holding facilities for additional sand volumes generated by the lagoon restoration. The sand placement/storage will likely introduce some impacts to the epifauna within the borrow sites, and future impacts are again anticipated when sand would be removed to support potential future beach nourishment activities. However, due to these historic and anticipated future disturbances associated with sand removal and storage, monitoring of the benthic community is not required. **Special Condition No. 7** requires bathymetric surveys of the two (2) offshore sites prior to sand placement and immediately following sand placement and again one year after sand placement. These surveys are necessary to ensure that the offshore sites have the capacity to store the estimated volumes of sands, and also to serve as verification that sand placed at these sites does not rise in elevation above the surrounding natural contours of eth seafloor.

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[25] Sebens, K.P. 1980. The Regulation of Asexual Reproduction and Indeterminate Body Size in the Sea Anemone *Anthopleura elegantissima* (Brandt). Biological Bulletin Marine Biological Lab, Woods Hole, V. 158:370-382.

[26] That is, the sampling shall be designed to have an 80% chance of picking up a 20% change. This is sometimes referred to as the 20-20-20 rule where Type I error (the null hypothesis is true but rejected) - or α - is set at 0.20, Type II error (the null hypothesis is false but accepted) - or β - is set at 0.20, and power is equal to 1-β, or 0.80. In other words, the plan shall specify biologically-meaningful effect sizes (*i.e.*, a difference between the reference sites and the impact sites) and specify α and β, with α = β. The field sampling plan shall include sufficient replication to provide a statistical test with at least 80% statistical power (β = 0.20) to detect an effect of the stated size with α = 0.20.

The ability to utilize these borrow sites as temporary sand storage facilities minimizes additional and more significant potential impacts to sensitive biological resources along the nearshore, while at the same time allowing for future use of this important sand resource to support beach replenishment projects. If the estimated 400,000 cubic yards of material that is proposed to be stored offshore were instead placed on local beaches, it would represent an almost doubling of the sand volume proposed to be placed along the coast, thereby increasing the likely magnitude of impacts to sensitive sandy beach, rocky intertidal and rocky subtidal communities.

Comparison with Previously-Permitted Beach Replenishment Projects

There are several important considerations for the proposed beach replenishments at Cardiff State Beach and Fletcher Cove, relative to other previously-permitted replenishments. First, the proposed project seeks to beneficially re-use sand from within the littoral cell, and more importantly, from a source immediately upcoast of where the sand would have naturally flowed from were it not for other man-made obstructions, to the replenishment beach sites. The sand from San Elijo Lagoon is not imported (as will be the case at Broad Beach, for example), nor is it sourced from offshore areas (as was the case with previous SANDAG projects); rather, it naturally belongs at these downcoast beaches and therefore, the proposed project can be interpreted as facilitating previously-impeded natural processes to restore these beaches to a relatively natural state even if the event itself is rather episodic. Second, the sand from San Elijo Lagoon matches the physical properties of the sand already occurring naturally on the receiver beaches and thus, alterations to the physical habitat, including the interstitial spaces beach infauna reside within, the slope of the beach that defines tidal zonation, and the sand color that affects heat retention of the beach itself, are maintained - these are all among the characteristics necessary for the long-term preservation of biological communities and maintenance of ecological integrity at these beaches. When the replenishment sand characteristics are dissimilar from that of the native material, as has occurred at beaches in San Diego County and elsewhere, the change to physical habitat likely drives significant changes to sandy beach ecosystems, and may result in the conversion to less productive ecosystems. Third, the proposed project constitutes a single replenishment event, without ongoing beach maintenance (*i.e.*, grooming or additional replenishment events), which limits direct impacts to a single point in time; thus while initially resetting communities to a depauperate state, it will allow for natural successional processes to immediately resume within the ecosystem in the absence of subsequent disturbance. Elsewhere, ongoing beach management activities have likely limited the ability of communities to recover through natural processes. For these reasons, the proposed project is considered to likely limit but not altogether eliminate adverse impacts to the sensitive marine resources.

Previous monitoring programs associated with permitted replenishment projects have focused on gross-scale changes to either physical structure defining the extent of habitat(s), and/or changes in broad functional groups of biological communities. However, such coarse-scale approaches have failed to capture the importance of physical features such as the space between reef substrate where species such as lobster or abalone reside, as well as shifts in the composition of biological communities and the ecosystem functions or services they provide for. For example, anecdotal information suggests that previous replenishment projects have affected commercially-important lobster populations. If beach replenishment projects are indeed affecting such resources, it would be important to understand this and promote that replenishment methods be

conducted in such a way that they can be sufficiently protective of sensitive marine resources and yet achieve shoreline protection and public access goals. To inform our understanding of potential beach replenishment impacts on sensitive marine resources, **Special Condition No. 5** specifically includes objectives requiring the quantitative characterization of biological communities that may be impacted.

Another important shortcoming in previous replenishment projects, which has been recognized in hindsight, has been the lack of statistical rigor in monitoring programs. In the absence of such rigor, the ability to assess potential impacts and require mitigation for them has been severely limited due to inconclusive results. Much of this may have been avoided had the monitoring programs been adequately designed to have sufficient statistical power and thus, an ability to fairly assess project impacts. For this reason, **Special Condition No. 5** specifically includes requirements for the monitoring design, criteria to detect adverse impacts, and methods to quantitatively assess adverse impacts to sandy beach, rocky intertidal, and subtidal rocky reef ecosystems.

CONCLUSION

In conclusion, the proposed restoration project will restore the biological productivity of the lagoon ecosystem. While the proposed project may temporarily impact ESHA and marine resources, it has been designed and conditioned with mitigation measures to reduce impacts to less than significant levels, and to ensure long-term monitoring of the lagoon and marine environment following restoration and sand placement. Therefore, the Commission finds that the proposed project, as conditioned, is consistent with Sections 30230, 30231, and 30240 of the Coastal Act, as well as the applicable policies from the City of Encinitas's LCP..

F. COASTAL HAZARDS

Section 30235 of the Coastal Act states:

> *Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. […]*

Section 30253 of the Coastal Act states, in applicable part:

> *New development shall do all of the following:*
>
> *(a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.*
>
> *(b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs* […]

TIDAL INLET ARMORING

Coastal Act Sections 30235 and 30253 acknowledge that seawalls, revetments, cliff retaining walls, groins and other such structural or "hard" methods designed to forestall erosion may also alter natural landforms and natural shoreline processes. Thus, with the exception of new coastal dependent uses, Section 30235 limits the construction of shoreline protective devices to those required to protect existing structures or public beaches in danger from erosion. The Coastal Act provides these limitations because, as discussed below, shoreline protective structures can have a negative impact on coastal resources.

Under Coastal Act Section 30235, shoreline protective structures may be approved if: (1) there is an existing structure or public beach in danger from erosion; (2) shoreline construction is required to protect the existing threatened structure; and (3) the required protection is designed to eliminate or mitigate the adverse impacts on shoreline sand supply. Even when a shoreline protective device is determined to be necessary and designed in a manner protective of shoreline sand supply, the structure will often result in significant adverse impacts to coastal resources.

The San Elijo Lagoon tidal inlet is currently armored by unpermitted or pre-Coastal Act concrete riprap and construction debris on both the western and eastern banks. It is unclear when the concrete riprap was originally installed, however, photographs of the construction of the Plastino Building, permitted in 1983, (CDP No. 6-83-21) show the riprap. The applicant proposes to install additional rip rap along the western bank of the inlet to protect the slopes from being eroded and undermined by increased scour associated with elevated tidal flow velocities due to the expanded tidal prism within the lagoon, stormwater runoff with high velocities, sea level rise, and increased wave action. The predicted erosion of the western bank would threaten the stability of an office building and Coast Highway 101. Additional armoring of the east side of the inlet was approved as a part of the rail double-track project (Consistency Certification No. CC-0004-15). Under current conditions, the site experiences bank erosion and the owner of the existing office building has previously received a permit from the Commission for the temporary placement of 35, 4,000-lb. sandbags along a portion of the western slope (CDP 6-14-0516). At that time, Commission staff conducted a technical review of the existing structure and determined that the building foundation was in significant risk of being undermined and the proposed slope stabilization would not only protect the existing structure but also the lagoon from potential impacts from the unstable building.

The hydraulic study prepared for the subject project FEIR concluded that peak outgoing velocities for the proposed project would be approximately 2 feet higher per second than current velocities of 5 feet per second when modeling tidal flow velocities for existing sea level and for 2 feet of sea level rise. Thus, existing shoreline erosion will likely intensify with increased velocities associated with the proposed project and further threaten the existing office building and Coast Highway.

While the proposed project inherently alters natural shoreline processes because it changes the way in which the shoreline interacts with tidal flows, the placement of 14,300 cubic yards of additional rip-rap in this particular case would not adversely impact the local shoreline sand supply at the lagoon mouth and adjacent beach as the footprint has historically been armored

with concrete riprap, construction debris, and, more recently, large sand bags. The applicant has committed to the removal of these materials prior to the placement of the proposed rip-rap to minimize the development encroachment into the channel.

In the original permit application, the applicant proposed to use rocks to armor the slopes abutting the two proposed pedestrian bridges in the lagoon. Section 30235 limits the construction of shoreline protective work to that required to protect existing structures and not new development such as the proposed bridges. Based on direction from staff, the applicant has committed to the redesign of the pedestrian bridges without armoring. Thus, **Special Condition No. 12** requires the applicant to submit final plans for the project that do not include protective devices such as rip-rap for the proposed pedestrian bridges. **Special Condition No. 17** further requires that the applicant submit as-built plans following construction to ensure that the rip-rap armoring conforms with the project approved by the Commission.

Therefore, the proposed development constitutes shoreline protection of an existing structure in danger from erosion and is permitted under Section 30235 of the Coastal Act.

FLOODING

Section 30253 of the Coastal Act requires that development minimize risks in areas of high flood hazard. A primary goal of the proposed project is to increase the hydraulic efficiency of the San Elijo Lagoon. Under current conditions, tidal exchange between the lagoon and the ocean is limited. Portions of Manchester Avenue, an important east-west arterial roadway extending along the entire northern perimeter of the lagoon, commonly experience flooding during moderate storm events. Within the lagoon, several structures restrict the movement and release of flood flows through the lagoon to the Pacific Ocean and contribute to the flooding of Manchester Avenue, including the dike and weir, Coast Highway 101, LOSSAN railroad, and I-5 bridge. When these structures were originally constructed, no formal flood control measures were implemented within the lagoon to compensate for the exacerbation of flood conditions.

The proposed project would increase the hydraulic efficiency of the lagoon in several ways. The main channel of the lagoon would be straightened and enlarged, and the channel network within the lagoon basins would be enlarged and extended to improve circulation into the secondary channel network. Infrastructure would also be improved to minimize constrictions at lagoon crossings, including removal of the dike and weir, and replacement of the bridges at I-5 (conducted by Caltrans as part of the San Elijo Lagoon I-5 Bridge replacement previously authorized by the Commission) and the railroad (conducted by SANDAG as part of the San Elijo Lagoon Double Track Project previously authorized by the Commission). These improvements within the channel network and at key infrastructure crossings would enable the lagoon to drain incoming freshwater more efficiently, both during dry weather flows and storm events. These same improvements to the channel network would also increase tidal influence in the east basin of the lagoon.

While the current 100-year flood elevations around the east basin and along Manchester Avenue exceed the road elevation by 2 to 4 feet, the proposed project would reduce flood elevations compared to existing conditions, and Manchester Avenue would not flood during the 100-year

flood event. Therefore, the proposed development minimizes risk in areas of high flood hazard and is permitted under Section 30253 of the Coastal Act.

Regardless, the proposed restoration project is located in a tidally influenced lagoon habitat subject to potential hazards from flooding. In addition, the beach nourishment component of the project is located on beaches that are subject to potential hazards from waves and storms. As such, **Special Condition No. 18** requires the applicant to assume all risks for developing in a location that is subject to waves, storms, and flooding.

SEA LEVEL RISE

Section 30253 of the Coastal Act requires that development minimize risks in areas of high flood hazard. Sea level rise (SLR) has occurred on a local and global scale over the past century, and projections suggest that its rate will likely accelerate in the future. Because the proposed development occurs in a coastal wetland, the project will be affected by future sea level rise as the tidal zone will increase in elevation relative to today. Thus, it is important that the project be developed to provide optimal wetland and transitional habitat based on tidal hydrology, with sea level rise considerations incorporated into the design. Potential effects of sea level rise include the following: high tides may reach farther into low-lying areas; flooding could persist longer and be more difficult to drain; higher water levels may cause greater erosion; and prolonged drought may affect species survival.

In March 2013, the State of California's Climate Action Team and Ocean Protection Council established the latest sea level rise guidance - with projected ranges in sea level rise of 0.13-0.98 ft. between 2000 and 2030, 0.39-2 ft. between 2000 and 2050, and 1.38-5.48 ft. between 2000 and 2100.[27] The Commission's Sea Level Rise Policy Guidance document, adopted in August 2015, found that the best available science suggests that sea level could rise by as much as 2 feet by the year 2050 and as much as 5.5 feet by the year 2100.[28,29] The SLR Study for this project was conducted in 2010, prior to the completion of the Commission's SLR Policy Guidance document. Thus, it relies on the available state guidance at the time from the California State Coastal Conservancy, and considers a rise in sea level of 2 feet by 2065 (50 years following predicted construction), and 4.6 feet by the year 2100.

These projected sea level rise scenarios have guided the restoration planning and engineering for the proposed project. The proposed project includes constructed transitional areas higher in

[27] Based on the latest and most relevant science presented in the 2012 National Research Council Study.

[28] The 2012 National Research Council's Report, Sea Level Rise for the Coasts of California, Oregon and Washington: Past Present and Future, is currently considered the best available science on sea-level rise for California. The NRC report predicts that for areas south of Cape Mendocino, sea level may increase between 16.56 and 65.76 inches between 2000 and 2100 (NRC, 2012).

[29] California Coastal Commission Sea Level Rise Policy Guidance – Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits – Adopted August 12, 2015.

elevation, which are intended by design to transition from uplands to wetlands under sea level rise, or from a higher elevation wetland to a lower elevation wetland. Additionally, the lagoon has existing areas outside of the tidal influence, such as upland slopes surrounding the lagoon and freshwater and brackish wetland areas within the east basin, these gradual slopes are anticipated to convert to tidally influenced wetlands as sea level rise occurs. As conversion occurs, habitat distribution within the lagoon would shift.

Thus, the proposed project has been designed to account for sea level rise and is consistent with Coastal Act Section 30253.

G. PUBLIC ACCESS AND RECREATION

Section 30210 of the Coastal Act states:

> *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

Section 30211 of the Coastal Act states:

> *Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.*

Section 30212 of the Coastal Act states, in applicable part:

> *(a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or, (3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway. […]*
>
> *(c) Nothing in this division shall restrict public access nor shall it excuse the performance of duties and responsibilities of public agencies which are required by Sections 66478.1 to 66478.14, inclusive, of the Government Code and by Section 4 of Article X of the California Constitution.*

Section 30213 of the Coastal Act states, in applicable part:

> *Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. […]*

Section 30223 of the Coastal Act states:

> *Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.*

In addition, the following City of Encinitas LUP policies relate specifically to protection of public access and recreation:

> *POLICY 5.1: The City recognizes Cardiff Beach State Park, San Elijo Beach State Park, South Carlsbad Beach State Park and Moonlight Beach (future City) State Park, as the major visitor destination beaches in the Encinitas area. The City will work with the State to upgrade and promote access to these State beaches, and will act to upgrade and promote access to Moonlight Beach, in order that they may receive an increased proportion of visitor uses.*
>
> *POLICY 5.3: The areas of South Carlsbad Beach State Park, Moonlight Beach State (future City) Park, Cardiff Beach State Park and San Elijo Beach State Park shall be designated as high intensity beach recreational use areas.*
>
> *POLICY 8.6: The City will encourage measures which would replenish sandy beaches in order to protect coastal bluffs from wave action and maintain beach recreational resources. The City shall consider the needs of surf-related recreational activities prior to implementation of such measures.*
>
> *POLICY 10.3: The City shall explore the prevention of beach sand erosion. Beaches shall be artificially nourished with excavated sand whenever suitable material becomes available through excavation on dredging, in conjunction with the development of a consistent and approved project. The City shall obtain necessary permits to be able to utilize available beach replenishment sands (as necessary, permits from the Army Corps of Engineers, California Coastal Commission, Department of Fish and Game, EPA, etc.).*

Section 30210 of the Coastal Act requires that maximum public access and recreational opportunities be provided and Section 30211 requires that development not interfere with the public's right to access the coast. Section 30212 requires that access from the nearest public roadway to the shoreline be provided except where it is inconsistent with public safety or the protection of fragile coastal resources, or adequate access exists nearby.

The proposed project will be located within public recreational areas including San Elijo Lagoon, Cardiff State Beach, and Fletcher Cove.

SAN ELIJO LAGOON

San Elijo Lagoon Conservancy operates a nature center and leads educational programs within the lagoon. The San Elijo Lagoon contains seven miles of public trails, including one Americans with Disability Act (ADA)-accessible loop trail (Exhibit 15). A number of recreational opportunities are available from these trails, including walking/running, bird watching, nature

observation, and photography. Restoration of the lagoon would have both temporary and permanent impacts to these trails.

The project includes the construction of two pedestrian bridges in the central basin, including a northern bridge that would span the main channel near I-5 a southern bridge spanning the secondary channel. These bridges would add 0.25 mile of trails to the current system and a link between the south and north sides of the central basin, providing additional connectivity through the lagoon.

Additionally, Caltrans' projects include improvements to the trail segment underneath the I-5 highway bridge which would provide better east-west movement. This improved segment along the south side of Manchester Avenue would include a new pedestrian-friendly streetscape linkage to the pedestrian bridge that would be suspended under the west side of the new I-5 bridge. This pedestrian bridge would extend north to south and would connect to a new trail under I-5 on the south side of the lagoon that would provide connection to existing trails on the west and east sides of I-5 via the Santa Inez Trail. While loss of the Dike Trail would occur, north-south access would not be precluded and would be maintained via the aforementioned enhancements as trail users could access the new I-5 bridge trail from Manchester Avenue and link to the Santa Inez trail that provides a connection to trails in the southern portion of the lagoon on both the east and west sides of I-5.

Public access improvements included in adjacent infrastructure projects within the lagoon will further enhance connectivity within the lagoon system and to the coast. A pedestrian undercrossing will be constructed as a part of the railroad improvements that will facilitate a safe crossing for trail users to the coast, and the new bike and pedestrian bridge scheduled for construction under the new I-5 bridge will allow for improved north-south connectivity. These improvements, along with a new trail connection to the Lagoon Conservancy center and improved parking facilities will result in a more robust and integrated trail system within the lagoon.

The project includes the permanent removal of an existing dike and weir in the east basin. At present, a trail along the top of the dike and weir provides the only access to the east basin trails from the north side of the lagoon. The trail is heavily used and, as such, is an important public access point. The Dike Trail would be accessible during Phase 1 of construction and then would be eliminated permanently. Removal of the dike and weir will promote tidal exchange east of I-5, one of the project's primary goals, as well as improve water quality and halt on-going habitat conversion by restoring hydraulical connectivity to the east basin. While the Dike Trail would be eliminated, north-south trail access across the east basin from Manchester Avenue to the Santa Inez Trail and the entire southern perimeter of the lagoon trail system would be provided through efforts underway by Caltrans, as part of the construction of an enhanced trail connection via a new pedestrian bridge constructed in association with the I-5 bridge replacement as a part of the Phase 1/Stage 1 of the I-5 North Coast Corridor Project.

Limited segments of the trails may be temporarily closed to access for public safety reasons during construction. Specifically, portions of the North Rios Avenue Trail west of the trailhead and parallel to the LOSSAN railroad would be restricted during lagoon restoration activities as

this area would serve as site access during construction. Currently, this trail also functions as a utility access road through the central basin and would be temporarily restricted to maintain public safety during construction. The North Rios overlook that extends into the lagoon is proposed as a construction staging area and would also be temporarily closed throughout the duration of construction which is anticipated to last three years. A portion of the Santa Inez Trail parallel to I-5 in the east basin would be closed and used for construction access and staging activities for approximately 18 months during construction. These trails would be returned to pre-project conditions immediately following construction, as required by **Special Condition 14**. The Nature Center Loop, Santa Carina, Santa Helena, and La Orilla trails would remain open for the length of the project.

To ensure that the public is notified of the trail improvements and to facilitate public access following construction, **Special Condition No. 3** requires the applicant to implement a trail signage plan that will be used to educate and manage public access to and along the lagoon trails.

In conclusion, removal of the dike and weir will benefit the lagoon ecosystem, the proposed trail improvements will provide increased public access opportunities, and any trail closures will be temporary during construction. Therefore, the Commission finds that the project, as conditioned, is consistent with the public access and recreation policies of the Coastal Act, as well as the applicable policies from the City of Encinitas's LCP.

MATERIAL PLACEMENT SITES

Section 30233(b) requires that dredged material be reused for beach nourishment on an appropriate beach if it is suitable. In this case, creation of an overdredge pit is necessary to contain contaminated material dredged during restoration of the San Elijo Lagoon. The excavation of the overdredge pit will result in approximately 850,000 cubic yards of clean material that will be available for reuse, and is proposed to be used, in part, for beach replenishment on two nearby beaches: Cardiff State Beach in Encinitas and Fletcher Cove in Solana Beach. These beaches are heavily used year-round and have historically been limited by narrower beaches, wave run-up that limits access during high tides, cobble and exposed sandstone rather than sandy beaches, and hazards from potential bluff collapse. However, following both RBSP I and II (CDP Nos. 6-00-038 and 6-11-018) beach nourishment events, average beach widths increased for both beaches. Additional sand on these beaches will increase the amount of available recreational area for public use, decrease the rate of beach erosion, and provide a buffer (a wider beach) between waves and adjacent private/public development, thereby potentially reducing pressure to construct shoreline protective devices, which can adversely affect the visual quality of scenic coastal areas, shoreline sand supply, and public access and recreation opportunities, by fixing the back of the beach.

It is difficult to estimate precisely how long the fill sand will remain on receiver beaches; however, the Environmental Impact Report for the project estimates that it would take from three to five or more years for the receiver beaches to return to their pre-project condition. During that time, the public will have the benefit of wider sandy beaches. The applicant proposes shoreline monitoring for five years following construction. The proposed monitoring would be similar to the Regional Shoreline Monitoring Program initiated by SANDAG in 1996, which measures the

beach width over time at beaches in San Diego County, including Cardiff State Beach and Fletcher Cove. Using a similar methodology in this case would allow the data collected following the proposed project to be compared to the historic results collected through SANDAG's Regional Shoreline Monitoring Program. **Special Condition No. 8** requires a final Shoreline Monitoring Plan to be submitted for Executive Director review and approval. **Special Condition No. 8** further requires that the applicant submit monitoring results to the Commission annually.

The significant public access and recreation benefits associated with the proposed beach nourishment activities would be accompanied by potential adverse effects on public access and recreation, including temporary closure of portions of the beach, construction equipment on the beach at and near the point of sand discharge, and potential changes to surfing conditions due to the introduction of a large quantity of sand and its migration into the littoral system over time.

Depending on the beach site and material excavation rates, up to 500 linear feet of the beach may be closed per day during beach replenishment activities. As sand placement activities shift along the beach, those areas in which sand placement has been completed would be reopened to public use. Lateral access along the back beach would be maintained throughout construction, with the exception of temporary closures to complete sand placement to the back edge of the beach as necessary, particularly where no alternative lateral access exists (e.g., where a wet beach abuts bluffs). In addition, ocean areas directly adjacent to sand transport and placement equipment and activities may also be temporarily closed to ensure public safety. In total, activity on the beach is expected to last 1-2 months for each beach, however, for a large portion of this activity, work will be limited to specific stretches of the physical beach.

In order to minimize these potential impacts to public access and recreation, the applicant proposes to: maintain buffers around ocean placement sites to avoid conflicts with water recreation users; be in constant communication with local jurisdictions and safety agencies, including beach lifeguards, to ensure notification and safety measures are implemented; and provide notifications in the local media to help ensure public awareness of the project and potential construction activities.

During project construction, temporary staging may occur in the San Elijo State Beach parking lot or on Coast Highway 101 south of the Chart House, which could impact the public's ability to access the beach. During beach replenishment activities, a relatively small (10-12ft. by 15ft.) trailer on skids will be on the beach within the 500-foot contained project area. The trailer would house spare parts, act as a temporary small office for the on-site engineer, maintain onsite documentation (plans, specs, conditions), and be a temporary shelter from the elements.

To ensure public access and safety is maintained during construction **Special Condition No. 15** requires that the applicant implement a Public Access Management Program with measures to facilitate safe public access around construction or staging areas, and include alternative access provisions and measures to notify the public and safety agencies of the closures. **Special Condition No. 13** requires that any public area used for construction or staging is returned to its pre-construction condition within three days of completion of activities.

In addition, the Commission has typically prohibited construction on beaches during the summer months, or, if summer construction is unavoidable, prohibited construction on weekends and holidays. Thus, **Special Condition No. 11** requires that beach nourishment activities take place outside of the busy summer season from Memorial Day weekend through Labor Day of any year.

Another recreational activity that is at risk from proposed beach nourishment is surfing. There are several well-known, iconic surf sites near, at, and between the two beach receiver sites, including Swami's, Cardiff Reef, Tabletops, and Pillbox. These surf spots are highly valued due to their reef breaks (as contrasted with more frequent and inconsistent beach breaks), where unique formations of waves break over the underwater reefs. Potential impacts to reef breaks are of particular concern as the addition of sand could bury the reef and cause it to behave more like a beach break.

The applicant conducted a Surfing Study, which examined the surfing resources of the project area and the potential impacts on surfing from beach nourishment. At Cardiff, the study analyzed the placement of 300,000 cubic yards of sand on-shore and 300,000 cubic yards of sand near-shore, an amount significantly larger than what is now proposed, and found that although there would be temporary impacts, long-term reef and sandbar conditions would remain as least as good as existing conditions. Wave backwash, which can affect wave quality, would be similar to existing conditions within six months. At the recommendation of staff, the applicant has revised the project to place only the 300,000 cubic yards of sand on-shore at Cardiff, and, thus, the temporary impacts to surfing would be significantly less than those analyzed as a part of the original project, which included a total of 600,000 cubic yards onshore and near-shore at Cardiff. At Solana Beach the study found similar effects of temporary changes and no long-term adverse effects. The study also notes that in the case of Solana Beach, monitoring for RBSP in 2001 (after placing the same amount of sand proposed for the subject project) found that surfing at nearby sites improved for a short time and then reverted to pre-project conditions.

Increased flows at the lagoon mouth resulting from the proposed project could also affect nearby surfing. The Surf Study found that increased currents would not affect Cardiff Reef or other adjacent surf spots, but recommended that monitoring of surfing and currents at Cardiff Reef should occur to quantify adverse impacts and identify potential mitigation measures. **Special Condition No. 9** requires the applicant to monitor the surf zone prior to commencement of nourishment activities and immediately following nourishment activities and to submit a monitoring report to the Commission.

In summary, the proposed project will have short-term impacts on public access and recreation, which have been minimized by conditions requiring that beach nourishment activities be conducted outside the summer season and that staging be designed to have the least impact on public access. Overall, the project will have a positive impact on public access and recreational opportunities at beaches in Cardiff and Solana Beach, and the required monitoring program will provide valuable information on the movement of sand along the shoreline that will be useful in planning and designing future sand replenishment projects. Therefore, as conditioned, the proposed project is consistent with the public access and recreation policies of the Coastal Act.

H. AIR QUALITY

Coastal Act Section 30253(d) states:

> *New development shall do all of the following:* […]
>
> > *(c) Be consistent with requirements imposed by an air pollution control district or the State Air Resources Board as to each particular development.*
> >
> > *(d) Minimize energy consumption and vehicle miles traveled.* […]

Section 30253 of the Coastal Act requires that new development minimize energy consumption and vehicle miles traveled, and that new development is consistent with air quality requirements, including restrictions on greenhouse gas (GHG) emissions. The proposed project has been designed to minimize impacts to air quality during lagoon restoration by closely coordinating with other projects in the same lagoon, utilizing an onsite overdredge pit, and by utilizing a pipeline to transport sediment for material placement activities.

As required by Senate Bill (SB) 468, and the NCC PWP/TREP, the San Elijo Lagoon Conservancy, Caltrans, and SANDAG have coordinated construction activities for the subject project with two other major projects within the same lagoon system, including improvements within the I-5 freeway and LOSSAN rail transportation corridors, in order to minimize energy consumption and impacts to sensitive coastal resources. Caltrans and SANDAG utilized the Construction Manager General Contractor (CMGC) procurement method to hire one contractor to construct all three projects, which allows greater collaboration and coordination among the major project components. To support early coordination efforts among key stakeholders, a steering committee comprised of decision makers from SANDAG, Caltrans, the San Elijo Lagoon Conservancy, and the CMGC was established to ensure the subject project progressed forward in a coordinated effort and that decisions were made in the best interest of the coastal resources within the lagoon system. This comprehensive planning effort has resulted in an overall shorter construction period, fewer environmental impacts due to shared construction staging areas and access points, reduced costs, lower risk, and greater transparency. Advantages of this integrated planning process on energy consumption include reduced truck trips (1,500 fewer trips to a landfill for clear and grub activities and 11,000 fewer truckloads of beach quality sand leaving the project site), the use of combined access/storage areas presenting an overall time and energy savings, and innovative technologies to reduce the amount of concrete needed for roadway paving and bridge construction.

The applicant proposes to place 850,000 cubic yards of materials for reuse at Cardiff State Beach, Fletcher Cove, and two off-shore sites. All four sites are located near enough to the lagoon to utilize pipelines to transport the material, completely avoiding the use of barges or trucks for transport. In addition, air emissions associated with the proposed placement sites are greatly reduced when compared with alternatives. Specifically, transport to the proposed placement sites would result in approximately 106 metric tons of carbon dioxide equivalent (CO_2e) emissions, while alternatives that include deposition at beaches located further away (i.e., Leucadia, Moonlight, Torrey Pines (EXHIBIT 17)) would require utilization of a combination of

pipeline and truck or barge trips that would at least quadruple emissions from that of the proposed placement sites. Moreover, trucking the material to Miramar Landfill would result in the release of approximately 8,489 CO_2e emissions, and barging the material to the LA-5 ocean disposal site would result in the release of approximately 33,017 CO_2e emissions.

In conclusion, the proposed project would minimize impacts to air quality, as described above. Therefore, the Commission finds that the subject project is consistent with Section 30253 of the Coastal Act.

I. VISUAL RESOURCES

Section 30251 of the Coastal Act states, in part:

> *The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas.*

Section 30251 of the Coastal Act requires that the alteration of natural landforms is minimized to protect the scenic and visual qualities of coastal areas, and that development is also sited to protect visual resources of coastal areas. The proposed project will result in temporary visual resource impacts during construction of the restoration activities at San Elijo Lagoon, and during material placement activities at Cardiff State Beach and Fletcher Cove.

The lagoon is bounded by designated scenic roads, including Coast Highway 101 to the west and Manchester Avenue to the north, and is traversed by an eligible state scenic highway (I-5) to the east. The lagoon is also visible from numerous trails within and around the perimeter of the lagoon, the San Elijo Lagoon Nature Center, Cardiff State Beach, and City of Encinitas designated vista points at San Elijo Avenue, Manchester Avenue and Kilkenny Drive (Exhibit 16).

Lagoon restoration would temporarily impact the visual environment by introducing construction equipment within the lagoon and changing views of the lagoon for an extended time period (three years). Motorists traveling on adjacent scenic roads would experience the least impact because the speeds at which they travel only allow brief views of the lagoon. In addition, many of the views from these roads also include views of the Pacific Ocean, which would remain intact. Temporary visual impacts from the lagoon trail system and vista points would be the most significant due to the extent of construction in the lagoon, and the sensitivity of viewers who are used to a particular view while on foot or bicycle.

Permanent visual changes would also occur to the lagoon itself as a result of the proposed redistribution of habitat types and open water areas. Specifically, existing channels and areas of mudflat would be enlarged, resulting in a higher proportion of open water and unvegetated areas compared to existing conditions. These changes would be in character with the visual

environment expected in a lagoon setting and, as such, would be compatible with the surrounding landscape.

Temporary visual impacts would also occur during material placement activities off-shore at the SO-6 sites and on-shore at Cardiff State Beach and Fletcher Cove and are anticipated to last 10 months in total. During off-shore placement at the SO-6 sites, a single pipeline would be visible in Cardiff as it traverses the beach and extends into the ocean. Once in the ocean, the pipe would extend along the ocean floor where it would be largely unseen. The pipe would then connect to an offshore mooring, monobuoy and barge which, similar to other boats, would be visible along the horizon. Material placement at Cardiff State Beach and Fletcher Cove would require similar construction equipment both on- and off-shore but would be more visually impactful as most activities would occur directly on the beach. Specifically, a pipeline would extend along the back of the beach to deliver sand into a training dike. Once settled, the sand would be spread across the beach by bulldozers. In total, construction activity on each beach is expected to last 1-2 months, however, for a large portion of this activity, work will be limited to specific stretches of the physical beach. While temporary visual impacts would occur on the beach during the construction period, the sand would be visually compatible with the surrounding beach following placement activities.

In conclusion, while temporary visual impacts would occur during construction, permanent alteration of natural land forms, including expansion of open water in the lagoon, would be minimal and remain compatible with the character of the surrounding lagoon and beach areas. Therefore, the Commission finds that the project as conditioned is consistent with Section 30251 of the Coastal Act.

J. ARCHAEOLOGICAL AND PALEONTOLOGICAL RESOURCES

Section 30244 of the Coastal Act states:

> *Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.*

Section 30244 of the Coastal Act requires that archaeological and paleontological resources in the Coastal Zone be protected from adverse impacts by applying reasonable mitigation measures. Section 30116 of the Coastal Act defines archaeological sites that are referenced in the California Coastline and Recreation Plan or as designated by the State Historic Preservation Officer (SHPO) as sensitive coastal resources.

Degradation of archaeological resources can occur if a project is not properly monitored and managed during earth moving activities and construction. Site preparation can disturb and obliterate archaeological materials to such an extent that the information that could have been derived would be permanently lost. In the past, numerous archaeological sites have been destroyed or damaged as a result of development. As a result, the remaining sites, even though often less rich in materials, have become increasingly valuable as a resource. Further, because archaeological sites, if studied collectively, may provide information on subsistence and

settlement patterns, the loss of individual sites can reduce the scientific value of the sites which remain intact.

Within the proposed project area, only one site, has been identified to contain known cultural resources. To protect the site from accidental disturbance, the project includes mitigation measures that prohibit grading in proximity to the site, limit construction equipment and vehicles to staked limits of disturbance, and require exclusionary fencing to be used in proximity to the site. **Special Condition No. 20** further requires that there be a qualified archaeologist and appropriate Native American consultant present on-site during all grading and vegetation clearance activities that occur within or adjacent to the recorded archaeological site in the project area. Therefore, the Commission finds that the proposed project, as conditioned, is consistent with Section 30244 of the Coastal Act.

K. LOCAL COASTAL PLANNING

Section 30604(a) requires that a coastal development permit shall be issued only if the Commission finds that the permitted development will not prejudice the ability of the local government to prepare a Local Coastal Program (LCP) in conformity with the provisions of Chapter 3 of the Coastal Act. In this case, such a finding can be made.

The proposed project would occur in three separate jurisdictions: the City of Encinitas, the City of Solana Beach, and the Commission's original permitting jurisdiction. The City of Encinitas has a certified LCP, but has requested that the Commission issue a consolidated permit for the portion of the project that would occur in the City's jurisdiction. The City of Solana Beach does not have a certified LCP. Therefore, the Commission is responsible for issuing a coastal development permit for the portion of the project that would occur within the City of Solana Beach's jurisdiction and within the Commission's original permitting jurisdiction.

As described above, the proposed project would restore the San Elijo Lagoon and provide sand for public recreation, both of which are consistent with the City of Encinitas's certified LCP and with Chapter 3 of the Coastal Act. Therefore, the Commission finds that the proposed project will not prejudice the ability of the City of Solana Beach to prepare a LCP or for the City of Encinitas to continue implementation of their certified LCP.

L. CALIFORNIA ENVIRONMENTAL QUALITY ACT

Section 13096 of the Commission's Code of Regulations requires Commission approval of Coastal Development Permits to be supported by a finding showing the permit, as conditioned, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect which the activity may have on the environment.

The County of San Diego, acting as lead agency, prepared an Environmental Impact Report (EIR)/Environmental Impact Statement (EIS). The EIR concluded that the project would cause

significant impacts to biology, cultural resources, paleontological resources, visual resources, air quality, noise, hazardous materials and public safety, and climate change and proposed various measures to mitigate all significant impacts. The Coastal Commission's review and analysis of land use proposals has been certified by the Secretary of Resources as being the functional equivalent of environmental review under CEQA. The preceding coastal development permit findings discuss the relevant coastal resource issues with the proposal, and the permit conditions identify appropriate modifications to avoid and/or lessen any potential for adverse impacts to said resources.

APPENDIX A – SUBSTANTIVE FILE DOCUMENTS

- Future Inlet Maintenance (CDP No. 6-16-0248)
- San Elijo Lagoon Double-Track Project (Consistency Certification No. CC-0004-15)
- Interstate-5 Improvements at San Elijo Lagoon (CDP No. 6-15-2092 and NOID No. NCC-NOID-0005-15)
- SANDAG, Regional Beach Sand Project (RBSP) I and II (CDP Nos. 6-00-038 and 6-11-018)
- Plastino Sand Bag Project 6-14-0516
- U.S. Army Corps of Engineers 50-year coastal storm damage reduction project (CD No. 0203-13)
- Senate Bill 468
- Final Environmental Impact Report for the San Elijo Restoration Project SCH# 2011111013, February 2016.
- Draft Physical and Biological Monitoring Plan for the San Elijo Lagoon Restoration Project, Norby Biological Consulting, July 2016
- Sampling and Analysis Plan Results Report, Addendum No. 1, Moffatt and Nichol, August 2016
- San Elijo Lagoon Restoration Project Sea Level Rise Analysis Draft Report, Moffatt and Nichol, July 2010
- San Elijo Lagoon Restoration Project 65% Basis of Design Moffat and Nichol, February 2016
- NOAA Comment Letter April 15, 2016
- Status of Eutrophication in the San Elijo Lagoon and its Relevance for Restoration, Martha Sutula, David J. Gillett, and Aaron Jones SCCWRP July, 2016
- San Elijo Lagoon Restoration Project Comparison of Air Quality Emissions for Material Placement Options, received from AECOM on October 5, 2016

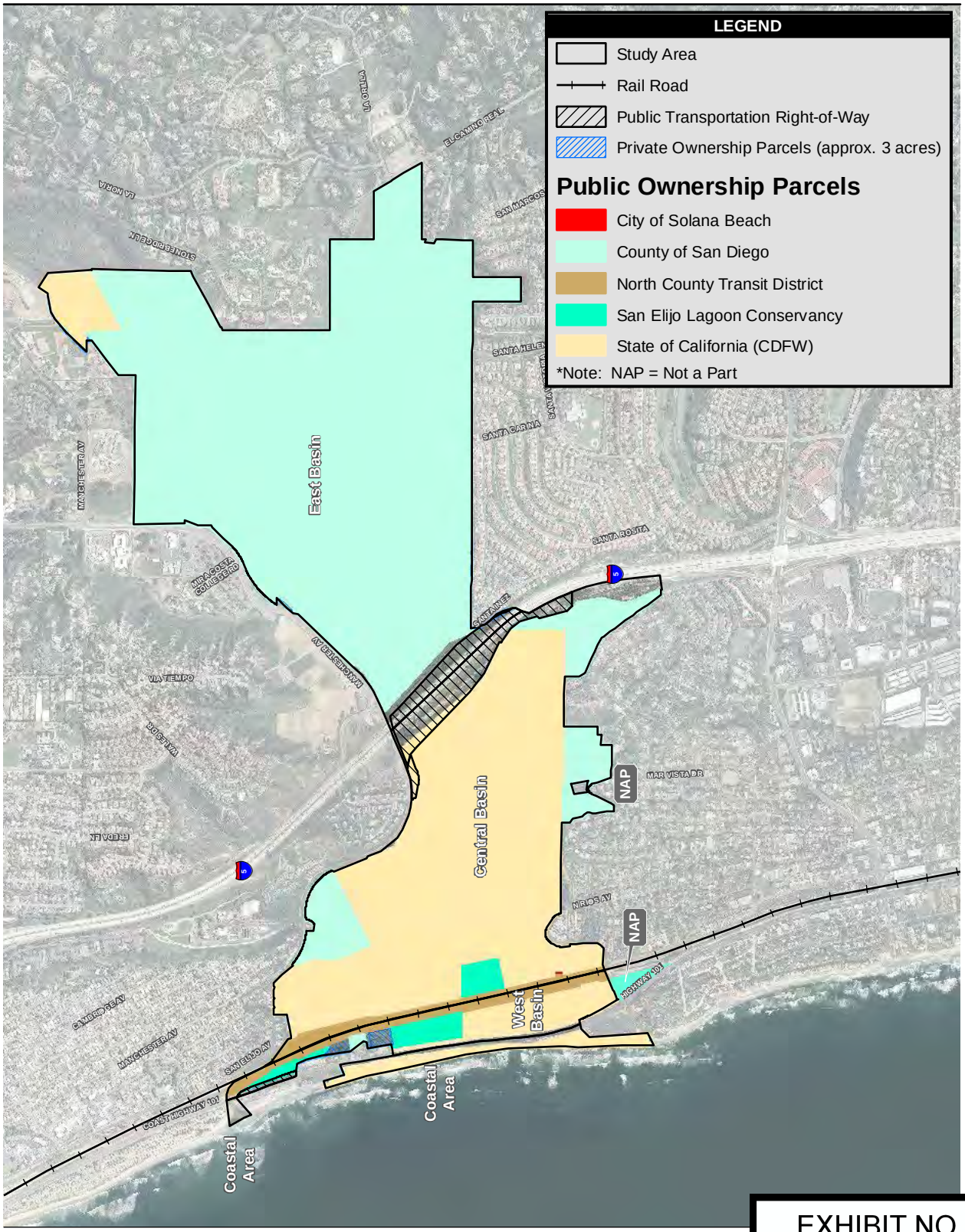
EXHIBIT NO. 1
APPLICATION NO.
6-16-0275
Vicinity Map
California Coastal Commission

N

EXHIBIT NO. 2
APPLICATION NO. **6-16-0275**
Aerial Photograph
1 of 2 California Coastal Commission


T's Cafe Solana Beach
Java Depot
Tidewater Tavern
Station Sushi
Naked Cafe
Fletcher Cove
Beach Park
United States
Postal Service
Beach Grass
Hwy 101
N Sierra Ave
N Acacia Ave
S Hill
N Helix Ave
Pacific Ave
S Sierra Ave
S Acacia Ave
Google


N



Source: Landiscor 2010; SanElijoConservancy; SanGIS; AECOM 2012

2,000 1,000 0 2,000 Feet

Scale: 1:24,000; 1 inch = 2,000 feet

San Elijo Lagoon
Study Area a

San Elijo Lagoon Restoration Project Final EIR/EIS

Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\EIR_EIS\StudyArea_and_Ownership.mxd, 2/12/2014, steinb

EXHIBIT NO. 3

APPLICATION NO.
6-16-0275

Project Area and Land Ownership

California Coastal Commission

EXHIBIT NO. 4
APPLICATION NO.
6-16-0275
Proposed Project
California Coastal Commission

0 500 1,000 2,000 3,000 Feet

1 inch = 1,000 feet

Legend

- Railroad
- Project Boundary
- Pedestrian Bridges
- Pedestrian Trail
- Transitional Areas

Habitat Types

- Avian Nesting Area
- Berm / Roads
- Coastal Strand
- Eelgrass
- Tidal Channels & Basin
- Mudflat
- Low Salt Marsh
- Middle Salt Marsh
- High Salt Marsh
- Salt Panne
- Riparian
- Open Water/Freshwater Marsh
- Freshwater/Brackish Marsh
- Upland (Shown with Transparency Overlay)
- I-5 Expansion
- Rail Road Expansion (Preliminary)

Document Path: Q:\LB\7017-03 -San Elijo Lagoon\GIS\Mapfiles_MXDs\Alt1B_Reducedrefine_clippingwork2016_bu.mxd

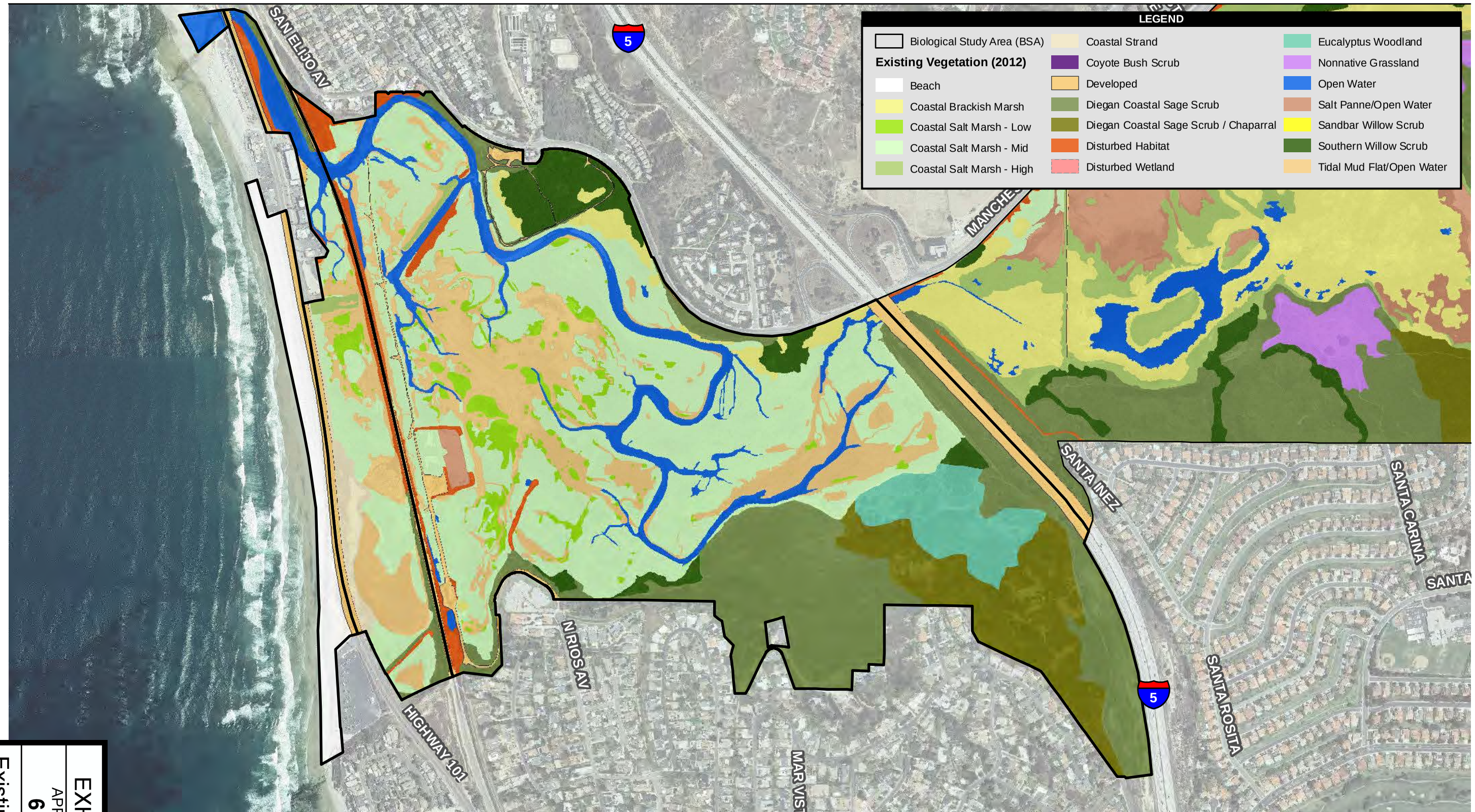
MOFFATT & NICHOL

Project location: Cardiff By the Sea, CA

REDUCED ALTERNATIVE 1B REFINED

San Elijo Restoration Project
Design & Final Engineering

11/15/2016



ECOM 2014

75 0 750 Feet

cale: 1:9,000; 1 inch = 750 feet

Restoration Project Final EIR/EIS

RP_EIR\6.0 GIS\6.3 Layout\EIR_EIS\Veg.mxd, 2/11/2014, steinb

Figure 3.6-1
Vegetation Communities within the BSA - Coastal, West, and Central Basin

EXHIBIT NO. 5
APPLICATION NO.
6-16-0275
Existing Conditions
1 of 2
California Coastal Commission

Source: SANDAG 2012; AECOM 2014

750 375 0 750 Feet

Scale: 1:9,000; 1 inch = 750 feet

Figure 3.6-2
Vegetation Communities within the BSA - East Basin

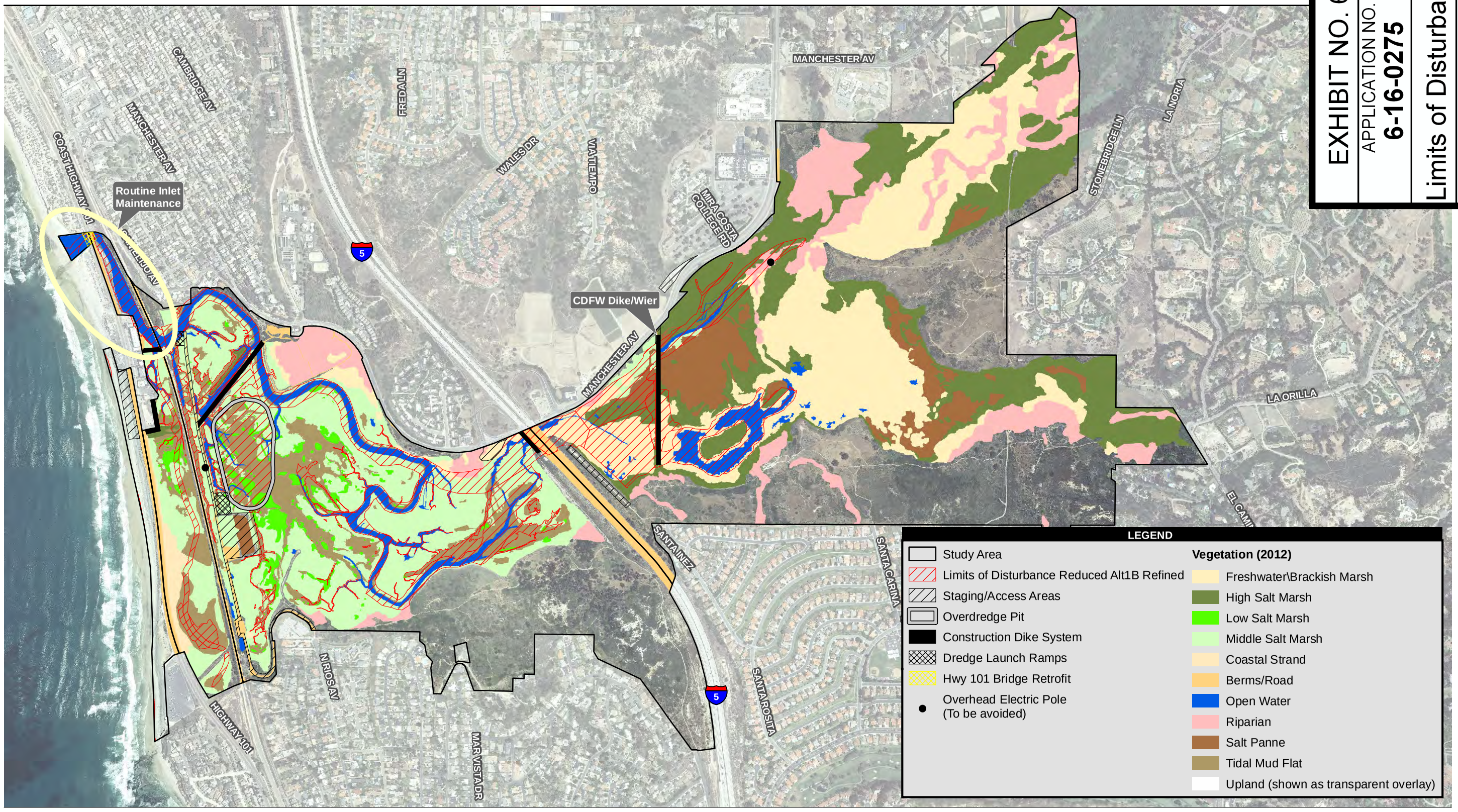
Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\EIR_EIS\VegEast.mxd, 2/11/2014, steinb

EXHIBIT NO. 6

APPLICATION NO.
6-16-0275

Limits of Disturbance

California Coastal Commission



Source: SANDAG 2012; MoffattNichol; AECOM 2013

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 2
Reduced Alternative 1B - Refined
Limits of Disturbance

San Elijo Lagoon Restoration Project

Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\Alternative1B_Optimized\Reduced_Alt1b_Refined_LOD_20161019.mxd, 11/18/2016, paul.moreno

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M E M O R A N D U M

TO: Melody Lasiter, Coastal Analyst

FROM: Laurie Koteen, Ph.D., Ecologist

RE: San Elijo Lagoon Restoration

DATE: November 8, 2016

Documents Reviewed:

Yang, X.-e., Wu, X., Hao, H.-l. & He, Z.-l. Mechanisms and assessment of water eutrophication. *Journal of Zhejiang University. Science. B* **9**, 197-209, doi:10.1631/jzus.B0710626 (2008).

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Patton, R. Monthly bird count data San Elijo Lagoon: Appendix D. D1-D4 (2009).

San Elijo Lagoon Conservancy. San Elijo Lagoon Fish and Invertebrate Data: Appendix E. E1-E9 (2009).

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Zembal, R., Hoffman, S. M. & Konecny, J. Status and Distribution of the Light-footed Ridgway's (Clapper) Rail in California: 2015 Season. 26 (Natural Resources Agency, Dept. of Fish and Wildlife Branch, San Diego, CA, 2015).

Zembal, R., Hoffman, S. M. & Konecny, J. Status and Distribution of the Light-footed Ridgway's (Clapper) Rail in California: 2015 Season. 28 (Natural Resources Agency, Dept. of Fish and Wildlife Branch, San Diego, CA, 2016).

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Introduction

San Elijo Lagoon is a unique ecological resource located at the southern end of the city of Encinitas, within San Diego County. Characterized by a mix of habitat types ranging from saline to freshwater wetlands to upland coastal sage scrub communities, the lagoon and its environs provide habitat for a broad range of plant and wildlife species, many of which enjoy protected status. The lagoon with Cardiff Beach at its western margin, and its extensive trail network, is also a valued recreational destination. Yet, the lagoon is highly-degraded, and remains in a state of continued decline. Urbanization within the surrounding watershed, a history of nutrient dumping directly into lagoon waters, and the construction of transit corridors that traverse and constrain lagoon hydrology are the primary causes. The lagoon is listed as a 303d impaired water body under the Clean Water Act due to prolonged and recurrent eutrophication events, sedimentation and bacterial loads that threaten human health to the point of periodic beach and near-shore closures. Moreover, constrained flow has promoted sedimentation in the lagoon's east basin and reduced the reach of tidal influence. These conditions have exacerbated circulation issues and led to the progressive conversion of saline and

brackish-water subtidal and mudflat habitats to freshwater marsh. Within the central basin, a muted tidal prism and sediment deposition has transformed mudflat to salt marsh habitat and low marsh to high marsh. Today, the lagoon remains in a transitional state towards a more homogenized set of habitats, and therefore is progressively less able to support the range of species that rely on its diverse resources.

Among all the issues facing the lagoon, water quality is the most urgent. In an estuary, water quality is the foundation for the health of the entire ecosystem. All aquatic life is directly reliant on water quality, and the flora and fauna which inhabit the lagoon waters serve as the base of the estuarine food web. Therefore, efforts to restore the physical and biological functions of the lagoon are focused on improving water quality by restoring tidal exchange to the entire lagoon, dredging tidal channels, widening or removing circulation barriers and removing nutrient-laden sediments. These measures should restore the hydrologic circulation patterns of the lagoon to those more closely resembling historic conditions, reduce turbidity and bacterial loads, and greatly decrease the frequency and severity of eutrophic events. The Coastal Commission strongly supports the goals of restoring the lagoon to a more fully functional system. Following the results of the CEQA process, Commission staff is in agreement that the chosen alternative, alternative 1B-refined, will provide the best suite of benefits to the ecosystem as a whole, recognizing that tradeoffs exist among water quality, habitat objectives, and the duration of short and long-term impacts.

Coastal Act Policies

The natural resource policies of the Coastal Act include several that relate to the protection of wetlands, open coastal waters and estuaries, and that protect environmentally sensitive habitat areas, or ESHA. Section 30233 regulates the fill and dredging of estuaries, and identifies a short list of allowable activities that include restoration. Further, Section 30233 allows for the dredging and filling "in open coastal waters, other than wetlands, including streams, estuaries, and lakes … that provide public access and recreational opportunities". San Elijo Lagoon provides numerous recreational opportunities, including over seven miles of public trails, a nature center, educational programs and plans for additional and improved trails. Restoration will also improve the recreational value of this resource further in that it provides for improved ecological conditions overall. Section 30240, which protects environmentally sensitive habitat areas (ESHA), limits uses in ESHA to those that are resource dependent. Habitat restoration is a resource dependent use. While the San Elijo Restoration Project (SELRP) will involve significant impacts to open coastal waters, wetland areas and ESHA over the duration of the project, the ultimate goal is to restore the natural hydrology of the system. Over the course of this process, managers will enhance, restore, and create native wetland and upland habitat resulting in increased ecological functioning of the 960 acre lagoon, and culminating in an ecosystem better able to support a diverse assemblage of species. Moreover, the chosen alternative, alternative-1B-refined represents the least environmentally damaging alternative. It will best meet the overall goals of the project as defined in the EIR, while minimizing dredging, temporary flooding and transportation of dredge spoils. Nutrient-laden sediments will also be appropriately disposed of. They will be removed from a portion of the lagoon bottom, and buried on site in an overdredge pit that is capped with a thick clay layer designed to sequester organic nutrients and prevent their entry into aquatic systems.

Eutrophication in San Elijo Lagoon

San Elijo Lagoon is listed as a 303d impaired water body under the Clean Water Act due in large part to the frequency, severity and duration of eutrophic events. Eutrophication is characterized by very low

dissolved oxygen levels (DO) throughout the lagoon; conditions which lead directly to fish kills, and which impair the benthic habitat that underpins the entire lagoon food web[1]. A combination of anthropogenic influences have created these conditions. These include a legacy of waste water sludge disposal in the lagoon's central basin, urbanization of the surrounding watershed and associated chemical, nutrient and fine sediment deposition, and a basin architecture resulting from the historical construction of transit corridors that cut across the lagoon, and highly constrain water flow. These transit corridors, (I-5, Highway 101 and the LOSSAN rail corridor), restrict the drainage of freshwater flows entering the San Elijo Lagoon from Escondido and La Orilla Creeks to the east and mute the tidal prism and tidal mixing of saline waters from the ocean to the west. Water flow and tidal reach are further obstructed by the presence of a weir in the east basin, under the Interstate-5 (I-5) bridge. Because water flow is restricted, flow velocities are reduced and even stagnant during some seasons and in given locations.

Such conditions – low flow velocities and high organic matter build-up - allow for protracted nutrient exchange between the water column and the accumulated organic sediments that reside along the lagoon floor. This environment engenders depressed oxygen levels via two primary mechanisms. High nutrient exchange creates a stock of dissolved nutrients within the water column that fuel algal blooms. As the algae decays, oxygen is consumed, depressing DO. The second mechanism involves the drawdown of DO by the large stock of organic sediments. Where water is stagnant, the microbial community associated with benthic organic sediments draws oxygen out of the water column and into the sediments as part of the decomposition process. This results in conditions very unfavorable to life in the lagoon waters. Only organisms that can tolerate prolonged hypoxic conditions, or short-lived organisms that can complete their life-cycles between eutrophic events, are able to survive in this environment. Data collected from 2003 – 2016 reflect the legacy and ongoing nature of these conditions.

In her recent assessment of the water quality conditions within San Elijo Lagoon, Martha Sutula and colleagues from the Southern California Coastal Water Research Project, (SCCWRP), used a three-pronged approach to quantify the eutrophication status of San Elijo Lagoon. This approach is based on State Water Board standards, the sediment quality benthic line of evidence assessment framework, (SQO BLOE), and a method developed by Sutula that aims to standardize the classification of the eutrophication levels in estuarine environments globally[2]. The assessment is based on levels of DO in milligrams per liter, the amount and percent cover of macro-algal abundance, and the taxonomy of the macroinvertebrate benthic community.

Following this approach, the SCCWRP researchers found that the lagoon had failed to achieve water quality goals in two of the three metrics. An extensive review of DO in five locations of the lagoon based on data from 2003 – 2016 revealed that DO conditions were "suboptimal[3]" approximately half the

[1] Yang, X.-e., Wu, X., Hao, H.-l. & He, Z.-l. Mechanisms and assessment of water eutrophication. *Journal of Zhejiang University. Science. B* **9**, 197-209, doi:10.1631/jzus.B0710626 (2008)

[2] Sutula, M., Gillet, D. J. & Jones, A. Status of eutrophication in San Elijo Lagoon and its relevance for restoration. Report No. Technical Report 938, 32 (Southern California Coastal Water Research Project, 2016).

Sutula, M., Green, L., Cicchetti, G., Detenbeck, N. & Fong, P. Thresholds of Adverse Effects of Macroalgal Abundance and Sediment Organic Matter on Benthic Habitat Quality in Estuarine Intertidal Flats. *Estuaries Coasts* **37**, 1532-1548, doi:10.1007/s12237-014-9796-3 (2014).

[3] Suboptimal was defined here as "DO conditions that can affect fish reproduction, larval recruitment and juvenile survival", with DO level between 2.8 and 5.8 mg/l.

time throughout the spring to fall period. Moreover, hypoxic[4] conditions prevailed 15 – 76% of the time over this same seasonal interval. The study authors also note that without restoration, the prevalence of low DO conditions are likely to increase within the lagoon as a result of global climate change because high temperatures are strongly correlated with hypoxic events. In contrast, macro-algal abundance, which was assessed for a two year period only, placed San Elijo Lagoon in the "moderate" to "high" quality category, and therefore failed to raise similar alarms. The third metric, the taxonomy of the macroinvertebrate community found the benthic environment to be "highly-disturbed" in virtually all cases, and it attributed this condition to a number of stressors, primarily DO, a high concentration of organic sediments and fluctuating salinity levels. This latter investigation was temporally extensive in that it spanned the same time period as the DO data collection from 2003 - 2016.

As noted above, water stagnation, prolonged freshwater drainage and a muted tidal prism are major causes of the eutrophic conditions that commonly occur in San Elijo Lagoon. To capture this dynamic, Moffatt and Nichol (project consultants) analyzed residence time throughout the lagoon during the dry season when eutrophic conditions are frequent. The concept of residence time[5] provides a useful measure of the rate of renewal of water in a hydrological system. In San Elijo Lagoon, the residence time indicates the amount of time required for hydraulic flushing by tidal waters. Tidal water is oxygenated, therefore the influx of ocean water serves to renew the oxygen supply to oxygen-poor water through mixing. The Moffatt and Nichol model found average residence times under current dry season conditions to be in line with those values shown (in days) below for the lagoon, Figure 1a[6]. Note that residence times are not estimated for the lagoon's eastern basin under current conditions because ocean water is prevented from reaching the east basin by the weir underthe I-5 highway, which obstructs flow. Therefore, one main project objective is to restore connectivity to the lagoon through widening and deepening the tidal inlet and the bridge opening beneath the new I-5 bridge, removing the I-5 weir, and dredging to open up tidal channels and facilitate hydraulic exchange. These steps should increase the reach of tidal influence, and allow ocean water to penetrate into the east basin.

Each of the proposed alternatives results in a different configuration of residence times throughout the lagoon, ranging from alternative 1A, which has a maximum residence time in the eastern portion of the east basin of 12.7 days to alternative 2B with a maximum east basin residence time of 3.6 days. Alternative 1B-revised, the chosen alternative, has residence times across the lagoon as presented in Figure 1b. With a target residence time of seven days generally viewed as indicative of good circulation in Southern California wetlands[7], alternative 1B nearly achieves that objective lagoon-wide. Alternatives 2A and 2B would improve lagoon hydraulic efficiency further relative to alternative 1B. However, alternative 1B is still preferred due to the more even balance of habitats
this alternative would achieve for resident species, and a shorter duration and extent of temporary impacts throughout the restoration period.

In addition to lagoon channel dredging and transportation infrastructure improvements, project proponents support removal of legacy nutrients from a former central basin settling pond to improve circulation throughout the lagoon. Cardiff and Solana Beach wastewater treatment plants discharged

[4] Hypoxia was defined here as "conditions that can cause acute mortality of fish and some invertebrate species", with DO levels less than 2.8 mg/l.

[5] Residence time can be conceptualized as the length of time a given water molecule is resident within a specific location of the lagoon.

[6] Moffat and Nichol, San Elijo Lagoon Water Quality Study. (Moffat and Nichol, Long Beach, CA, 2012).

[7] Moffat and Nichol, Moffat and Nichol, San Elijo Lagoon Water Quality Study, 2012.

organic materials into sludge beds for decades before this practice ended in the 1970s. These beds now serve as a source for the soluble reactive phosphates and nitrogen species that cause algal blooms, and which instigate a benthic flux of oxygen from the water column into the organic sediments along the lagoon floor[8] and fuel eutrophication.

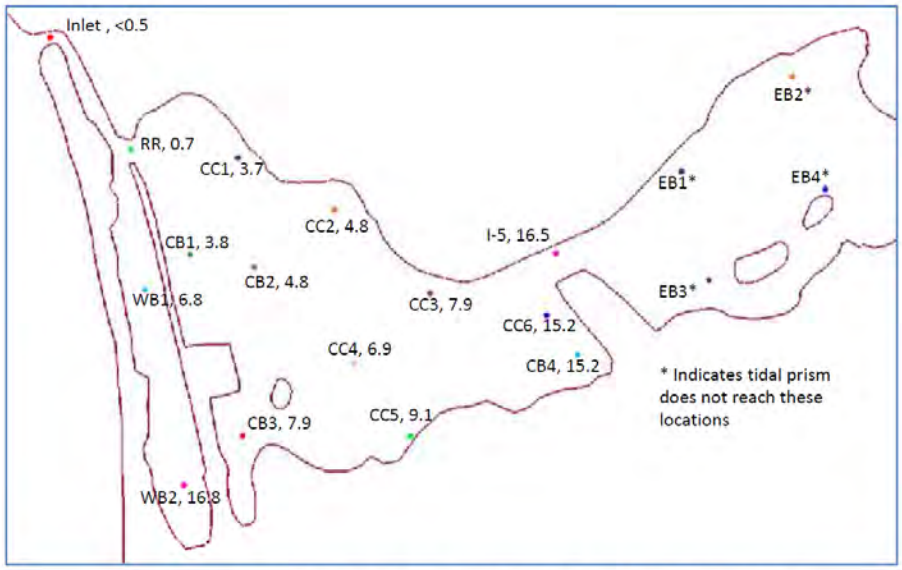


Figure 1a: Residence times (in days) in San Elijo Lagoon under existing conditions. (CB = Central Basin, EB = Eastern Basin, WB = Western Basin, CC = Central Channel)

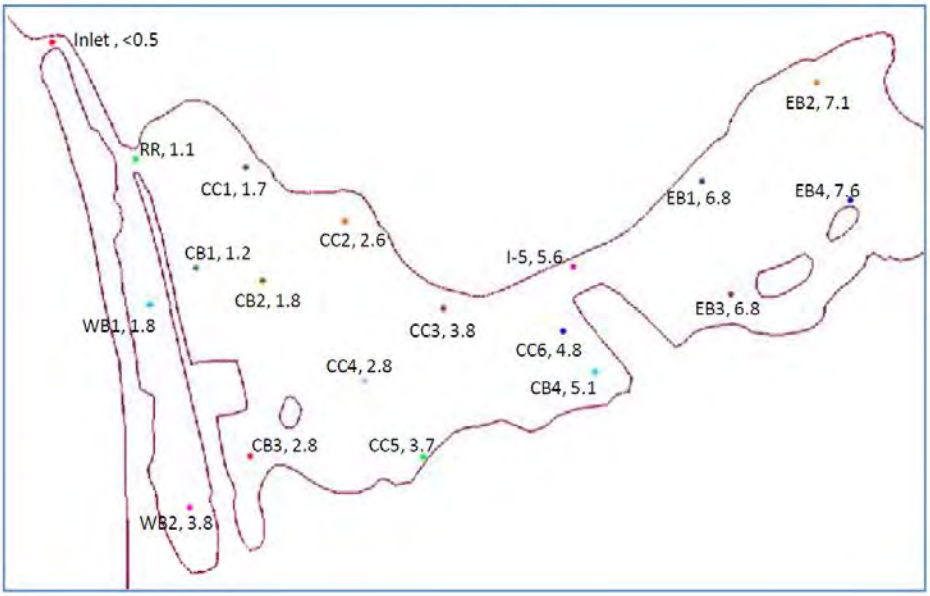


Figure 1b: Residence times (in days) in San Elijo Lagoon under Alternative 1B. (CB = Central Basin, EB = Eastern Basin, WB = Western Basin, CC = Central Channel)

[8] McLaughlin, K., Sutula, M., Cable, J. & Fong, P. Eutrophication and nutrient cycling in San Elijo Lagoon: A summer of baseline studies for monitoring order R9-2006-0076. Report No. Technical Report 636, 98 (Southern California Coastal Water Research Project, 2010).

Thought to now comprise approximately 115.5 acres of the central basin, several of the alternatives propose to dredge and remove large portions of these legacy sediments. Alternative 1B includes the removal of 38 acres, or 1/3rd of the sludge deposits, and this amount is considered sufficient to greatly improve the severity and duration of eutrophic events within the lagoon. During the winter season when storm events usher high nutrient loads into the lagoon from the surrounding watershed, water mixing is higher and temperature is lower; eutrophic events are less frequent and less severe. The greater circulation associated with alternative 1B should ameliorate these conditions further. Throughout the dry season, however, when conditions shift the lagoon towards a state of more frequent eutrophication, the organic sediments become the primary source of nutrients. In the most recent SCCWRP report, the study's authors concluded that "This mechanism assures that eutrophication symptoms will continue, even if watershed nutrient loads are drastically reduced."[9]. Therefore, their removal becomes a critical piece in improving lagoon water quality overall.

Sedimentation

In addition to problems with eutrophication, San Elijo Lagoon is 303d listed for fine sediments. Sedimentation in San Elijo Lagoon is a function of several factors, but is largely related to the constrained water circulation patterns which reduce the flow rate of sediment-laden waters. Additional factors include the suspended solid load in storm waters entering the lagoon and the size of suspended sediments, (sand, silt or clay-sized particles)[10]. Key threshold flow velocities are 0.6 feet per second, (fps), the flow rate at which sand size particles settle, and 0.3 fps, the flow velocity at which silt and clay size particles settle out of the water column. Flow rate is governed by the size of a storm event, the bathymetry of the lagoon basins and the configuration of basin inlets and outlets. Large storms will lead to higher rates of scour by storm waters within the watershed, translating to higher amounts of suspended solids in the water column. In San Elijo Lagoon, the shallow narrow downstream outlets beneath the I-5 bridge and the tidal outlet constrain flow, causing flow rates to slow in portions of the Eastern and Central basins. When flow rates slow beneath these key threshold values identified above, sedimentation occurs.

Moffatt and Nichol (2012) modeled flow velocities under current conditions and under the alternatives 1A, 1B, 2A and 2B. Of these four alternatives, 1A leads to little improvement in flow velocity and sedimentation. Alternatives 2A and 2B lead to the greatest reduction in hydraulic residence times, and the greatest improvement in predicted sedimentation rates compared to existing conditions. Alternative 1B, the preferred alternative, represents conditions that are a substantial improvement in sedimentation rates compared to the current condition and alternative 1A. During smaller storm events, sandy sediments are still likely to be deposited in the eastern basin near the mouth of Escondido Creek. Finer sediments are likely to remain in suspension throughout the east basin, with modeled flow velocities below 0.6 fps, but above the 0.3 fps threshold value. In the central basin, both fine and coarser sediment deposition will be improved under both large and small storm events under alternative 1B. These model results also apply to alternative 1B-refined that was developed following the choice of model scenarios.

[9] Sutula, M., Gillet, D. J. & Jones, A. Status of eutrophication in San Elijo Lagoon and its relevance for restoration. Report No. Technical Report 938, 32 (Southern California Coastal Water Research Project, 2016).

[10] Diameter of sediment particles: 0.05 mm < Sand particles have a diameter < 2mm; 0.002 mm < Silt particles < 0.05 mm; Clay particles < 0.002 mm according to the USDA Natural Resource Conservation Service, http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_054167

Enterococcus Bacteria (measured and modeled for alternatives)

Measurements taken at both the mass emission station and within the lagoon indicate that San Elijo Lagoon has high levels of three indicator bacteria, fecal coliform, total coliform and enterococcus, in excess of standards set by California Assembly Bill (AB) 411[11]. AB 411 requires local jurisdictions to regularly test for these indicator bacteria in coastal water bodies adjacent to public beaches from April through October of each year. If exceedances in the concentrations of these bacteria are found in San Elijo Lagoon, beach closure or posting of signs is required at Cardiff Beach. While harmful for "body contact", these three measured bacteria are primarily chosen to serve as readily-measured bacterial indicator species that signal the presence of fecal contamination of a water body. Fecal contamination often indicates the presence of other viral or bacterial species that are likely harmful to human health[12].

Bacterial standards are found to vary with the season, with significantly higher concentrations of indicator bacteria found during the wet season than the dry when extensively examined in 2008[13]. During the season in which the indicator bacteria were measured, all three bacterial species were found to exceed state water quality standards during and following wet weather storm events within the lagoon and at the mass emissions location. During dry weather conditions, water quality measurements indicated excessive levels of enterococcus and fecal coliform, but not total coliform. Of the three, enterococcus has been indicated as the best predictor of the presence of disease agents or pathogens leading to gastrointestinal illness.

In addition to measurements, the EIR for this restoration study included a modeling exercise intended to predict the concentrations of enterococcus that would exist under the restoration scenarios both during and after rain events. Because high concentrations of enterococcus generally coincide with high levels of fecal and total coliform, enterococcus modeling can be roughly viewed as a stand in for all three bacterial species. Modeling bacterial concentrations is a challenging exercise and one that would require many additional measurements for high precision, as both the incubation and inactivation rates of these bacteria are dependent on many factors. These factors include the sediment load and turbidity of the lagoon water, temperature, sunlight, nutrient supply and the hydraulic residence time at individual locations, among others. Nonetheless, modelers were able to predict the number of days in which bacterial standards were exceeded during and directly following a rain event by extrapolating from current conditions, and by making some additional modeling assumptions. Because the alternative 1B-refined had not been developed at the time of the model runs, alternative 1B was modeled, and is most similar to the preferred alternative.

Overall, the model revealed that enterococcus concentrations were ameliorated at the modeled lagoon locations under all alternatives following the rain event, (see Table 7-2 of Exhibit E of the EIR, reproduced below). Alternatives 2A and 2B reduced the number of days that exceedances occurred to zero at some locations following the simulated rain event, but actually increased the number of days exceedances occurred at some other, (3 compared to 2 at the Las Olas and Charthouse locations). Under current conditions, exceedances extend to 6 days at the lagoon outlet. In the model, alternatives 1A and 1B exhibited exceedances of 5 and 4 days respectively following the rain event. During the rain

[11] 1997. Beach sanitation: posting. Pages 1-6. Health and Safety Code.

[12] Wilcut L. 2016. Nationwide Bacteria Standards Protect Swimmers at Beaches. (https://www.epa.gov/beach-tech/nationwide-bacteria-standards-protect-swimmers-beaches)

[13] Moffat and Nichol. San Elijo Lagoon Water Quality Study, Appendix E, Environmental Impact Report, San Elijo Lagoon Restoration Project. Long Beach, CA (2012).

event, the number of exceedances were slightly reduced compared to current conditions under Alternatives 1A and1B at some locations within the lagoon, but not at others.

Table 7-2 Days of Enterococcus Bacteria Exceedance

Time	Location	Existing	Alt 1A	Alt 1B	Alt 2A	Alt 2B
During the 3-day Rain Event	SE-03, Seaside	2	0	0	1	1
	SE-04, Las Olas	2	1	1	3	3
	SE-05, Charthouse	2	2	1	3	3
	SE-06, SEL Outlet	3	3	3	1	1
Post Rain Event	SE-03, Seaside	0	0	0	0	0
	SE-04, Las Olas	0	0	1	0	0
	SE-05, Charthouse	0	0	1	0	0
	SE-06, SEL Outlet	6	5	4	0	0

Habitats and Species

San Elijo Lagoon currently supports a cornucopia of plants, wildlife and other species, Figure 2. In all, it was found that 231 vascular plants, 86 algae, 9 mosses, 1 liverwort and 4 species of fungi made the lagoon their home in one week-long survey conducted in May of 2009. In addition, in one 24 hour "bio-blitz", surveyors found 109 bird species, 213 insects, 28 spiders, 16 fish, 13 mammals, 11 reptiles and amphibians, 17 fresh water and marine invertebrates, and 1 arthropod for a total of 408 wildlife species[14]. Other surveys have found more species still: A monthly bird count survey in 2009 found more than 330 species of bird[15], and fish and invertebrate surveys found 23 species of fish and 28 benthic macro-invertebrates[16]. These figures are likely to be underestimates as some of these surveys were conducted over limited time periods and in just a few segments of the lagoon. Of the plant species found within San Elijo Lagoon, one species, Del Mar Manzanita, *Ceanothus verrucosus*, is federally endangered. One species, Orcutt's Goldenbush, *Hazardia orcuttii,* is on the state endangered species list. Twenty additional special status plant species were also found, with state or federal threatened status or a CNPS listing. An additional twelve special status plant species have the potential to occur within San Elijo Lagoon, but were not detected by recent surveys[17]. For wildlife, the lagoon also provides a very unique set of habitats that support a myriad of species. 45 species of special concern across diverse taxa have been positively detected within the lagoon, while an additional 52 were not detected during wildlife surveys, but have the potential to exist and/or breed within the lagoon based on the availability of habitat. Among those detected, the California least tern, the light-footed

[14] Free, J. *et al.* SELC Bioblitz: Appendix C. C1-C17 (San Diego, CA, 2009).
[15] Patton, R. Monthly bird count data San Elijo Lagoon: Appendix D. D1-D4 (2009)
[16] San Elijo Lagoon Conservancy. San Elijo Lagoon Fish and Invertebrate Data: Appendix E. E1-E9 (2009).
[17] Kinkade, C. *et al.* Biological resources technical report for the San Elijo Lagoon restoration project San Diego County, California: Appendix F. (AE Com, San Diego, CA, 2015).

Ridgway's rail, the Southwestern willow flycatcher and least Bell's vireo are state and federally listed as endangered. The Western snowy plover and the coastal California gnatcatcher are federally listed as threatened, and Belding's savannah sparrow is state listed as endangered[18].

Figure 2: Conceptual representation of coastal estuarine food web.

These species, and the habitats that support them are also imperiled by the current lagoon conditions. The same constriction of water movement that has led to impaired water quality and a disturbed benthic community within the lagoon, has also resulted in adverse effects to species throughout the food web. These effects stem both from the impaired nature of water quality, as well as the effect of constricted flow on the balance of habitats across the lagoon. Impoundment of fresh water in the east basin, particularly during large storm events, has promoted sedimentation within the east and central basins. This in turn has led to a conversion of open water or tidally-influenced mudflat habitats to continuously submerged marsh habitats that have become vegetated and increasingly colonized by freshwater marshland species. Similarly, where low marsh once existed, high marsh now dominates. This historical and on-going shift in habitat distribution was accelerated by long periods of tidal inlet closure and water impoundment prior to the 1990s. Since that time, the inlet has been repeatedly breached and an open inlet largely maintained, which has served to lower water levels in the central and western basins, but done little to ameliorate the highly-muted tidal expression. Prolonged inundation promotes habitat conversion toward a more homogenized mix of habitats, and degrades both physical and biological ecosystem functions. Although the lagoon is highly-altered from its historical habitat configuration generally, the open inlet status is thought to be more reflective of historical conditions, when inlet closures were relatively rare; a condition which is no longer supported by the urbanized

[18] Kinkade, C. *et al.* Biological resources technical report, (2015).

watershed and constrained flows that drain through the lagoon[19]. As a result, all alternatives evaluated include maintenance of an open inlet.

Ridgeway Rails

Captive-bred light-footed Ridgway's rails (formerly Clapper rails), *Rallus obsoletus levipes,* were reintroduced in San Elijo Lagoon over a period beginning in 2004[20]. The subsequent success of the reintroduction, and the increase in reproducing Ridgway's rail pairs, had led to points of disagreement among resource agencies over the chosen alternative, Alternative 1B-refined, and of the overall restoration goals of the project. After a long period of negotiation and planning, largely consensual, the US Fish and Wildlife Service, (USFWS), expressed reservations about the severity of projected temporary impacts to rails over the life of restoration actions, and about the planned conversion of habitat currently used by Ridgway's rails to other habitat types. That disagreement, however, now has reached resolution with some additional modifications to the project. Essentially, the project will remain similar to Alternative 1B-refined. However, there will be less alteration carried out within the central basin than is currently described in this alternative. The overdredge pit will remain in the previously sited location, but some of the additional fine sediments surrounding that location will be left in place. In addition, channel dredging in the central basin will be reduced, and one large planned channel will be abandoned, in order to leave areas of low marsh used by the Ridgway's rails in place. The tradeoff will be a small reduction in water quality improvements in the central basin and perhaps an increase in residence time in some locations, (still undergoing model revision).

The position of Coastal Commission staff in these discussions has been, and continues to be, that an ecosystem-based approach must be taken to restore the lagoon despite the endangered status of the rail. The position the USFWS has advocated is a single species approach. Furthermore, we believe that improving water quality will improve the quality of San Elijo Lagoon's habitat for Ridgway's rails, as well as for the large complex of diverse taxa that rely on a functioning lagoon ecosystem. More fundamentally, we see that the quality of aquatic habitat provides a foundation for the entire estuarine food web. If water quality is impaired, the organisms that live part or all of their life cycle within the water column or in the benthic environment will also be impaired; their diversity and abundance circumscribed by eutrophic conditions. Accordingly, the species that feed on these aquatic organisms will also be affected. For this reason, we see the restoration of water quality as the highest restoration priority. Moreover, we see the effort to restore the lagoon to a balance of several habitat types across salinity and elevation gradients, as a solution that will increase the diversity of species the estuary is able to support. Although temporary impacts to Ridgway's rails and other species are certain to occur over the course of restoration implementation, both the abridged duration of Alternative 1B-refined compared to other considered alternatives, and the ability to complete restoration activities concurrent with other lagoon-altering projects, (e.g. transportation upgrades to I-5and the LOSSAN rail line), will minimize overall impacts. More broadly we note that the Ridgway's rail populations are growing across the Southern California Bight and were estimated at more than 600 breeding pairs in 2015; a population

[19] Beller, E. *et al.* Northern San Diego County Lagoons Historical Ecology Investigation. 215 (San Francisco Estuary Institute - Aquatic Science Center, 2014).

[20] Zembal, R., Hoffman, S. M. & Konecny, J. Status and Distribution of the Light-footed Ridgway's (Clapper) Rail in California: 2014 Season. 26 (Natural Resources Agency, Dept. of Fish and Wildlife Branch, San Diego, CA, 2014).

high since annual surveys began in 1980[21]. 2016 estimates were higher still, with an estimated 656 breeding pairs region-wide[22].

In all, the Coastal Commission supports the chosen restoration alternative, alternative 1B-refined, with the additional refinements agreed upon in the month of October 2016 among resource agencies. This alternative achieves the best mix of habitat types, and takes important steps towards improving water quality throughout San Elijo Lagoon. The restoration activities and adaptive management extending into the future will greatly improve hydraulic circulation within the lagoon, will expand the reach of tidal influence, will remove a large stock of nutrient-laden sediments, reduce sedimentation and bacterial loads and support a wide diversity of plant and wildlife species.

[21] Zembal, R., Hoffman, S. M. & Konecny, J. Status and Distribution of the Light-footed Ridgway's (Clapper) Rail in California: 2015 Season. 26 (Natural Resources Agency, Dept. of Fish and Wildlife Branch, San Diego, CA, 2015).

[22] Zembal, R., Hoffman, S. M. & Konecny, J. Status and Distribution of the Light-footed Ridgway's (Clapper) Rail in California: 2016 Season. 28 (Natural Resources Agency, Dept. of Fish and Wildlife Branch, San Diego, CA, 2016).

Vegetation Communities and Other Cover Types	Coastal Area	West Basin	Central Basin	East Basin	Total
Riparian and Wetlands					
Coastal Brackish Marsh			6.1	125.4	131.5
Coastal Salt Marsh – High Littoral Zone		0.8	0.7	118.5	120.0
Coastal Salt Marsh – Mid Littoral Zone		16.7	121.3	3.4	141.4
Coastal Salt Marsh – Low Littoral Zone		1.5	11.8		13.3
Disturbed Wetland [1]				1.1	1.1
Open Water (Tidal Channels & Basin)	1.5	4.3	23.7	10.6	40.1
Saltpan/Open Water			1.5	35.4	36.9
Sandbar Willow Scrub [1]				9.0	9.0
Southern Willow Scrub [1]			14.4	47.0	61.4
Tidal Mudflat/Open Water		13.8	49.25		63.1
Subtotal Riparian and Wetlands	***1.5***	***37.1***	***228.8***	***350.4***	***617.8***
Uplands					
Coyote Bush Scrub				7.5	7.5
Diegan Coastal Sage Scrub		3.1	67.0	108.0	178.1
Diegan Coastal Sage Scrub / Chaparral			27.7	21.6	49.3
Eucalyptus Woodland			15.7	3.4	19.1
Nonnative Grassland				33.0	33.0
Subtotal Uplands	***0***	***3.1***	***110.4***	***173.5***	***287.0***
Other Cover Types					
Beach	15.0				15.0
Coastal Strand		5.0			5.0
Developed (Berm Roads)	3.0	5.2	10.4	4.9	23.5
Disturbed Habitat		2.5	6.7	2.6	11.8
Subtotal Other Cover Types	***18.0***	***12.7***	***17.1***	***7.5***	***55.3***
TOTAL	**19.5**	**52.9**	**356.3**	**531.4**	**960.1**

Disturbed wetland, sandbar willow scrub, and southern willow scrub are combined into a riparian vegetation community when discussing impacts and alternatives.

Source: FEIR Appendix F San Elijo Lagoon Restoration Project – Biological Resources Technical Report December, 2015

EXHIBIT NO. 8
APPLICATION NO.
6-16-0275
Existing Vegetation Communities
California Coastal Commission

Temporary Effects to Habitats (acres)

Habitat	Existing	Grading/Dredging/Fill and Staging/Access	Inundation	Total Temporary Direct Effects
Beach[2]	40 2	2.1	0.0	2.1
Coastal Brackish Marsh	131.5	21.6	0.0	21.6
Coastal Salt Marsh – High	120.0	10.4	0.0	10.4
Coastal Salt Marsh – Low	27.3	6.5	1.1	7.6
Coastal Salt Marsh – Mid	140.2	30.5	1.7	32.2
Coastal Strand	5.0	0.0	0.0	0.0
Developed	23.4	4.5	0.0	4.5
Diegan Coastal Sage Scrub/Chaparral	227.5	2.8	0.3	3.1
Disturbed Habitat	11.9	2.7	0.0	2.7
Open Water	40.0	30.2	5.5	35.7
Salt Panne/Open Water	37.0	5.0	0.0	5.0
Riparian[3]	70.2	2.1	0.0	2.1
Tidal Mud Flat/Open Water	50.3	14.9	10.8	25.7
Grand Total	**923.0**	**133.2**	**19.4**	**152.6**

[1] Total temporary effects include grading, dredging, inundation, and staging.

[2] Includes beach mapped in the Reserve, as well as Cardiff Beach onshore materials placement site, where wester snowy plover are known to roost. Does not include Solana Beach, as western snowy plover and California least tern do not utilize this beach.

[3] Southern willow scrub and sandbar willow scrub were considered together as "riparian" for this analysis.

EXHIBIT NO. 9
APPLICATION NO.
6-16-0275
Temporary Habitat Impacts
California Coastal Commission

Table 4 Proposed Action Habitat Distribution

Habitat Type	Habitat Distribution (acres)		Habitat Type	Habitat Distribution (acres)	
	Existing[1]	Proposed Action		Existing[1]	Proposed Action
Avian Nesting Areas	0	2	Open Water/Tidal Channels and Basins	40	**69**
Mudflat	50[2]	**52**	Riparian	70	67
Low-Marsh	27	**51**	Coastal Strand	5	5
Mid-Marsh	140	**119**	Upland & Others	299	295
High-Marsh	120	**122**	Beach	15	15
Salt Panne	37	32	Berms and Roads	23	24
Freshwater/Brackish Marsh	132	101	Transitional (man-made)	0	**5**

[1] Existing habitat acreages are from 2015 mapping efforts and reflect habitat distributions at that time.

[2] Current functioning mudflat is an artifact of past freshwater impoundment and is converting to mid-marsh because it is not at an elevation for sustainable mudflat.

Source: Nordby and M&N 2012; M&N 2015

EXHIBIT NO. 10

APPLICATION NO.

6-16-0275

Proposed Habitat Distribution

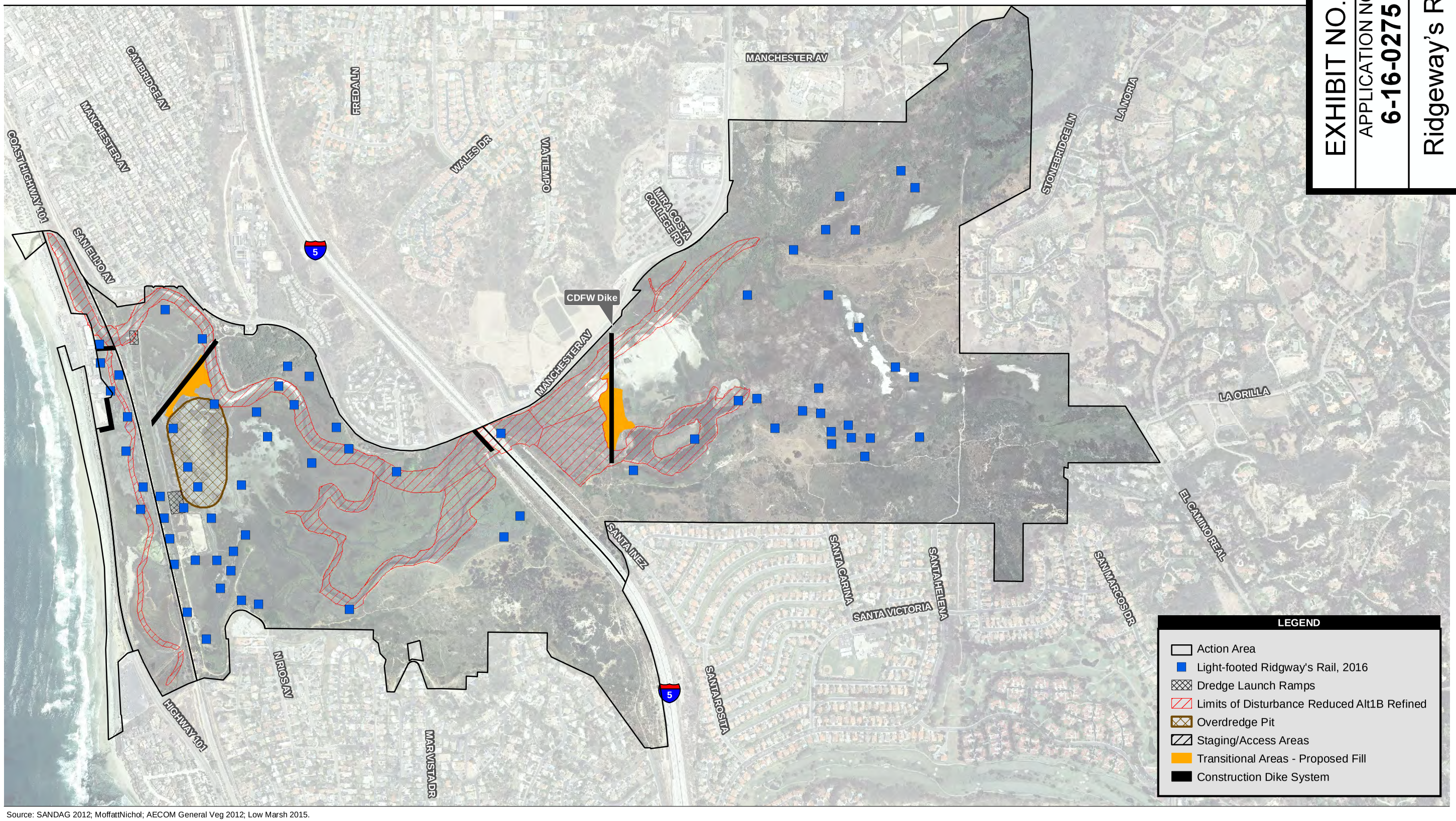
California Coastal Commission

EXHIBIT NO. 11

APPLICATION NO.
6-16-0275

Ridgeway's Rail Impacts

California Coastal Commission



Source: SANDAG 2012; MoffattNichol; AECOM General Veg 2012; Low Marsh 2015.

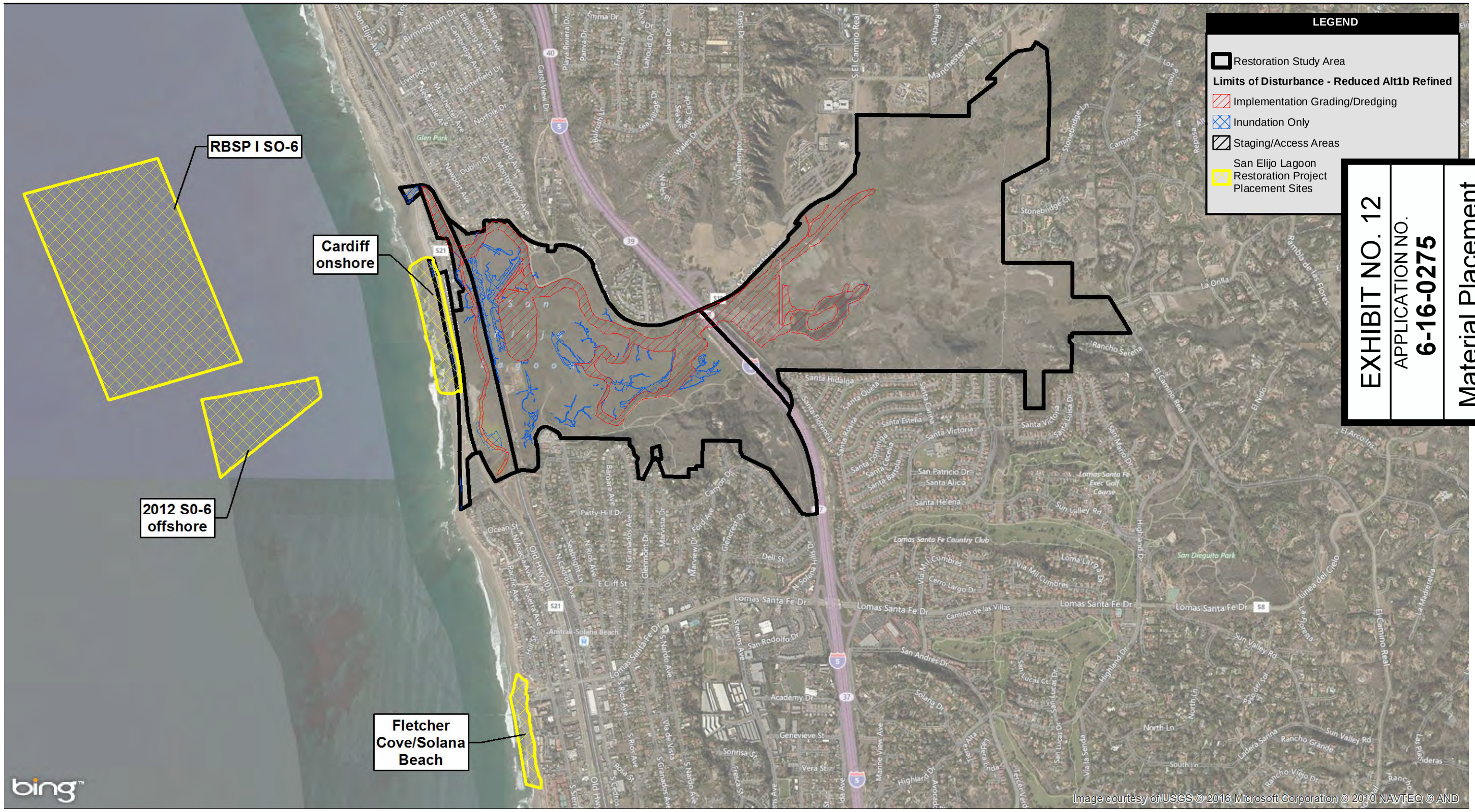
1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Alternative 1B - Refined
2016 Light-footed Ridgeway's Rail Impacts

San Elijo Lagoon Restoration Project

Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\Alternative1B_Optimized\Reduced_Alt1B_Refined_2015_Veg_with_2016_Clappers.mxd, 10/25/2016, paul.moreno



Source: Bing; San Elijo Lagoon Conservancy; SanGIS; AECOM 2012; M&N 2016.

1,750 875 0 1,750 Feet

Scale: 1:21,000; 1 inch = 1,750 feet

Figure 2
Material Placement Overview October 2016
San Elijo Lagoon Restoration Project

Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\Alternative1B_Optimized\Materials Placement Overview Nov 2016.mxd, 11/4/2016, paul.moreno

Source: SANDAG 2012; MoffattNichol; AECOM 2014

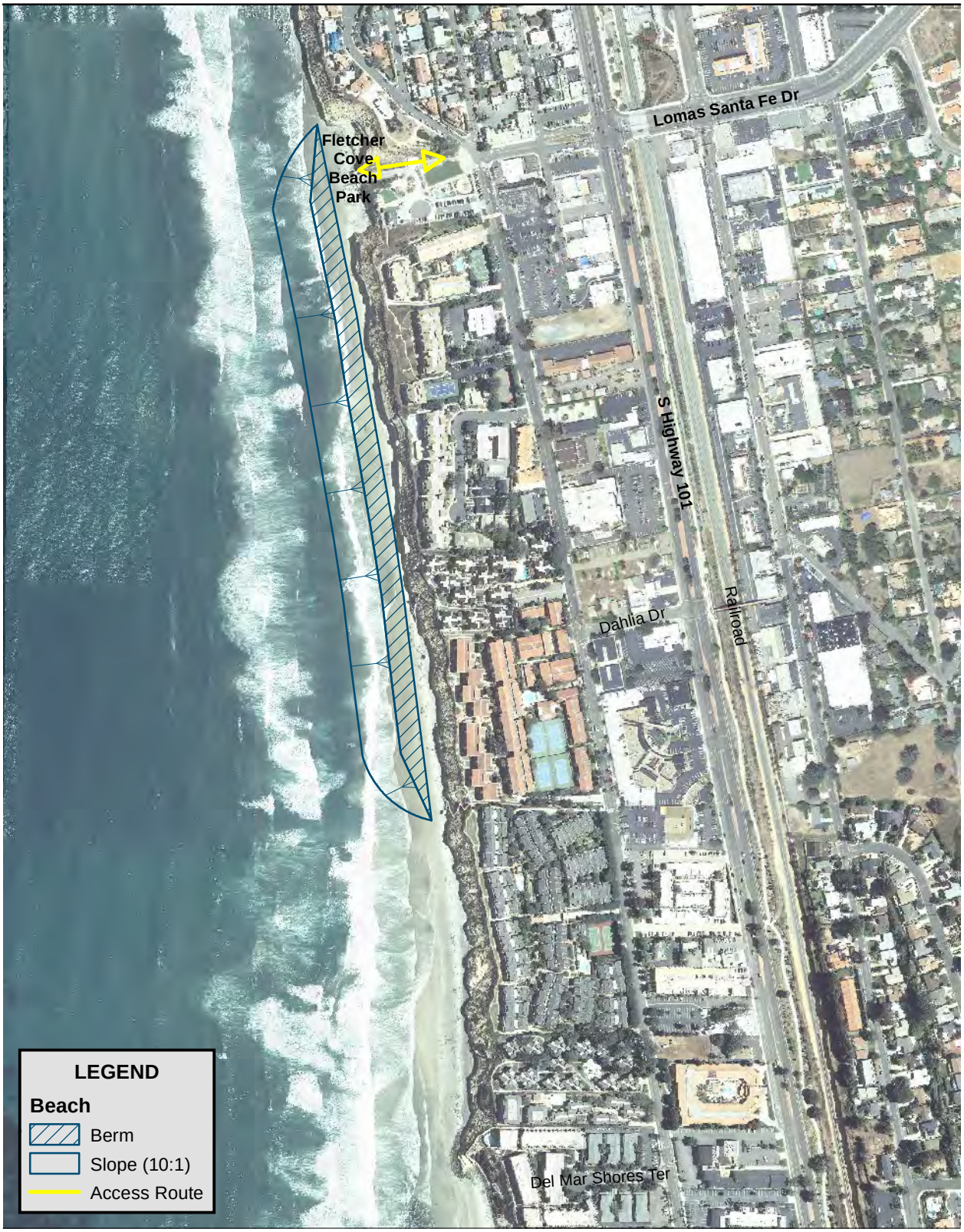
500 250 0 500 Feet

Scale 1:6,000; 1 inch = 500 feet

Materials Placement
Site Cardiff

San Elijo Lagoon Restoration Project

Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\EIR_EIS\Disposal_Sites_Cardiff_Revised_20161118.mxd, 11/18/2016, paul.moreno



Source: SANDAG 2012; MoffattNichol; AECOM 2014

500 250 0 500 Feet

Scale 1:6,000; 1 inch = 500 feet

Figure 2-11D
Materials Placement Site
Solana Beach

Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\EIR_EIS\Disposal_Sites_series.mxd, 7/23/2014, janssenn

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Marine Region
1933 Cliff Drive, Suite 9
Santa Barbara, CA 93109
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

September 30, 2016

Cindy Kinkade
Project Manager
AECOM
401 West A Street, Suite 1200
San Diego, CA 92101

Subject: San Elijo Lagoon Restoration Project Sand Material Deposition in Existing Offshore Borrow Pits Located in the Swami's State Marine Conservation Area (SMCA)

Dear Ms. Kinkade:

The California Department of Fish and Wildlife (Department) has reviewed the letter dated September 13, 2016 in which you request the Department's concurrence regarding the placement of beach-quality material at two placement sites within the Swami's SMCA. This material would be generated as a result of the San Elijo Lagoon Restoration Project (SELRP), a project proposed jointly by the San Elijo Lagoon Conservancy and the California Department of Transportation. San Elijo Lagoon is located between the cities of Solana Beach and Encinitas in northern San Diego County. As part of this construction, approximately 830,000 cubic yards of larger-grained material suitable for reuse in the littoral zone will be generated. The majority of the material will be used for beach nourishment.

Placement of material in excess of the beaches' capacity at two offshore locations would allow material to be stockpiled for potential future beach nourishment use while minimizing impacts. Both of the proposed offshore placement sites (referred to as 2001 SO-6 and 2012 SO-6) are located west of the lagoon in the southeast corner of the Swami SMCA.

The Department has reviewed the proposed project and has determined that the proposed activity is consistent with the exception to the take restrictions in the Swami's SMCA for beach nourishment and other sediment management activities (14 C.C.R. section 632(b)(138)(C)). As such, the Department does not object to the use of the two offshore borrow pits located in the Swami's SMCA as sand material storage sites.

Sincerely,

Craig Shuman, D. Env
Regional Manager
Marine Region

ec: California Department of Fish and Wildlife

Ms. Becky Ota, Program Manager
Marine Region
Becky.Ota@wildlife.ca.gov

Mr. William Paznokas, Senior Environmental Scientist (Supervisor)
Marine Region
William.Paznokas@wildlife.ca.gov

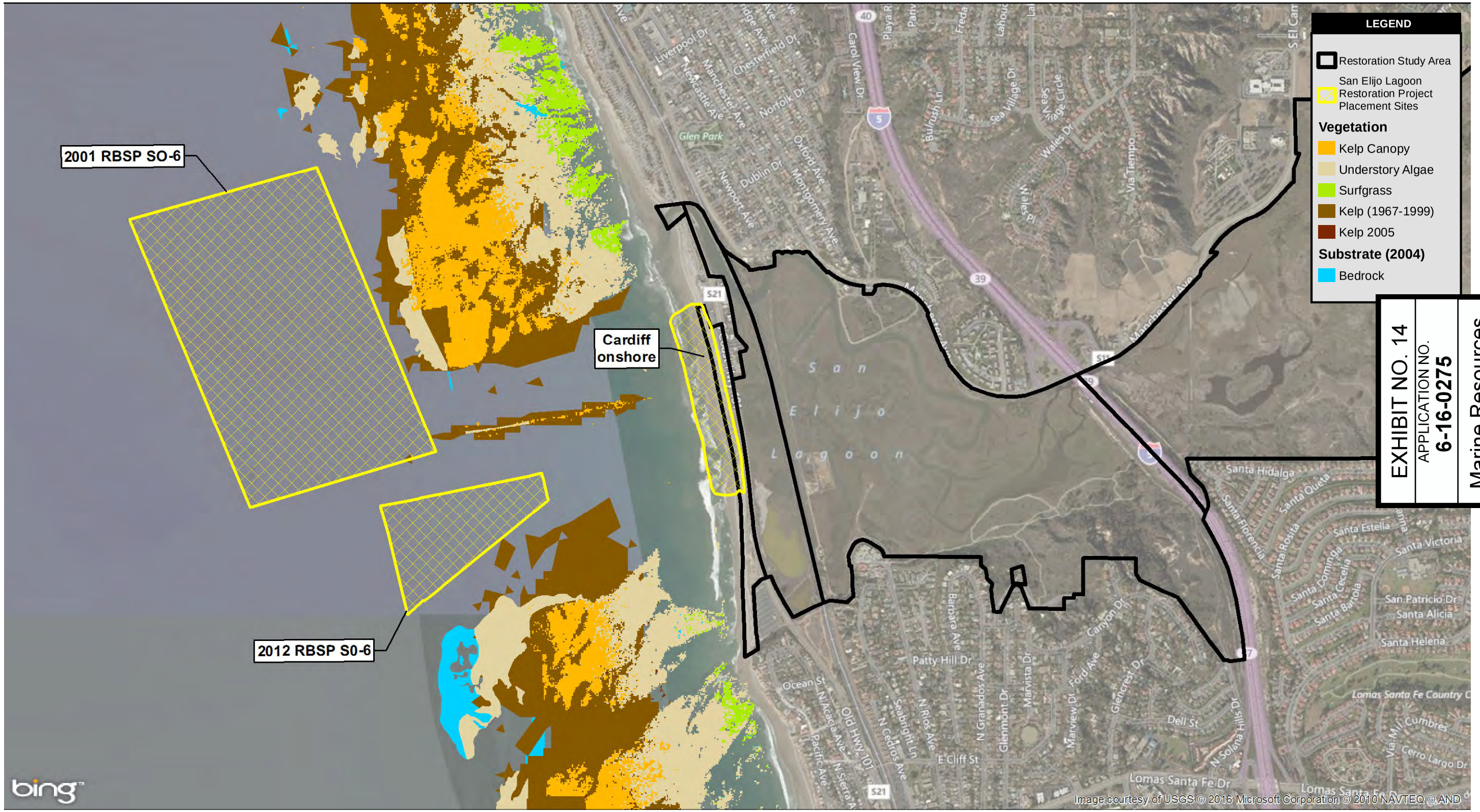


EXHIBIT NO. 14
APPLICATION NO.
6-16-0275
Marine Resources
1 of 2
California Coastal Commission

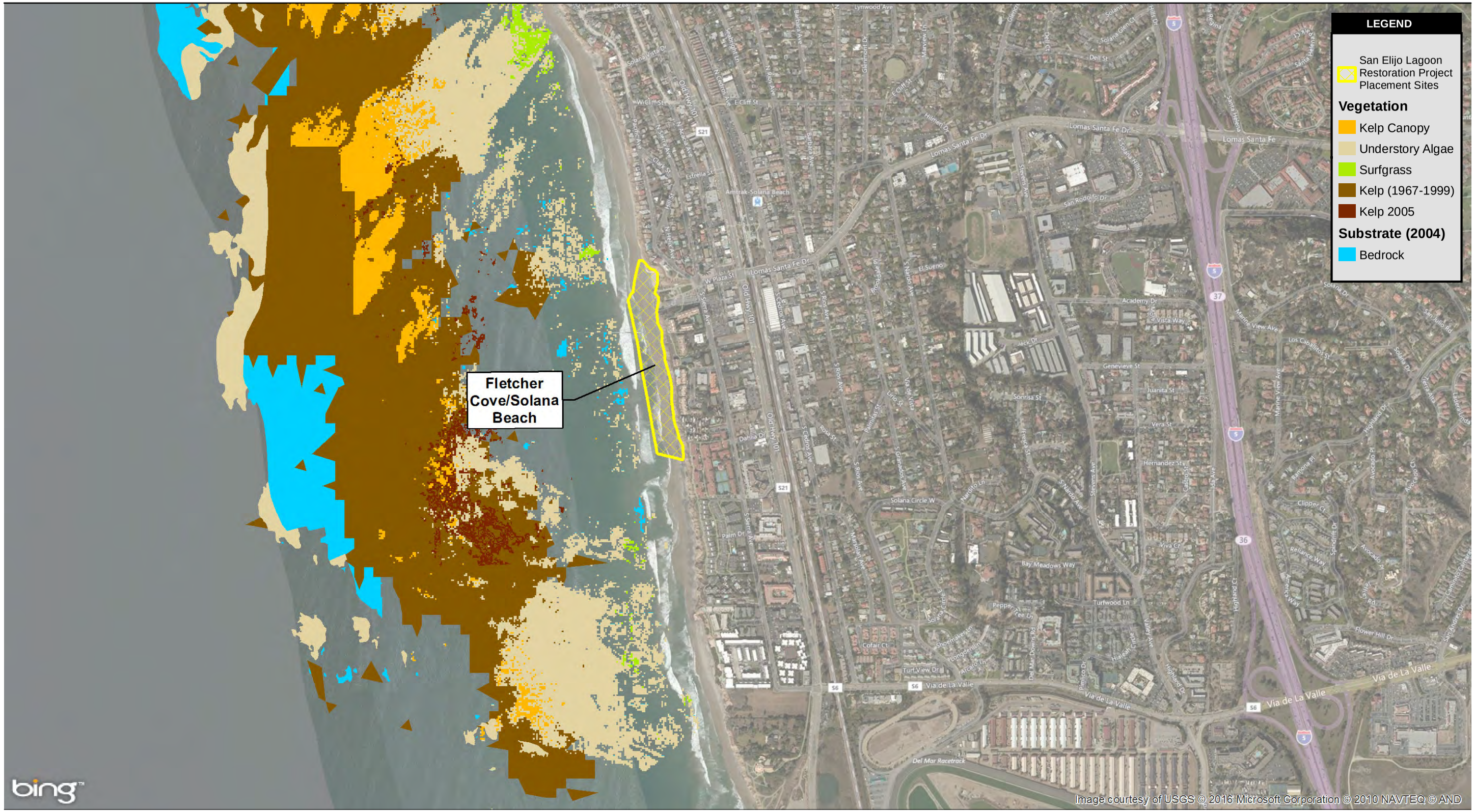
Source: Bing; San Elijo Lagoon Conservancy; SanGIS; AECOM 2012; M&N 2016.

1,250 625 0 1,250 Feet

Scale: 1:15,000; 1 inch = 1,250 feet

Material Placement Sites and Nearshore Resources
Cardiff and SO-6
San Elijo Lagoon Restoration Project

Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\Alternative1B_Optimized\Materials Placement with Nearshore Resources.mxd, 11/21/2016, paul.moreno



Source: Bing; San Elijo Lagoon Conservancy; SanGIS; AECOM 2012; M&N 2016.

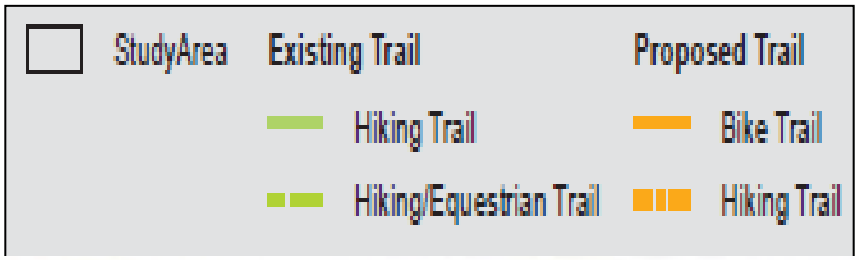
1,000 500 0 1,000 Feet

Scale: 1:12,000; 1 inch = 1,000 feet

Material Placement Sites and Nearshore Resources
Solana Beach
San Elijo Lagoon Restoration Project

San Elijo Lagoon Restoration Project

Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\Alternative1B_Optimized\Materials Placement with Nearshore Resources_Solana.mxd, 11/21/2016, paul.moreno



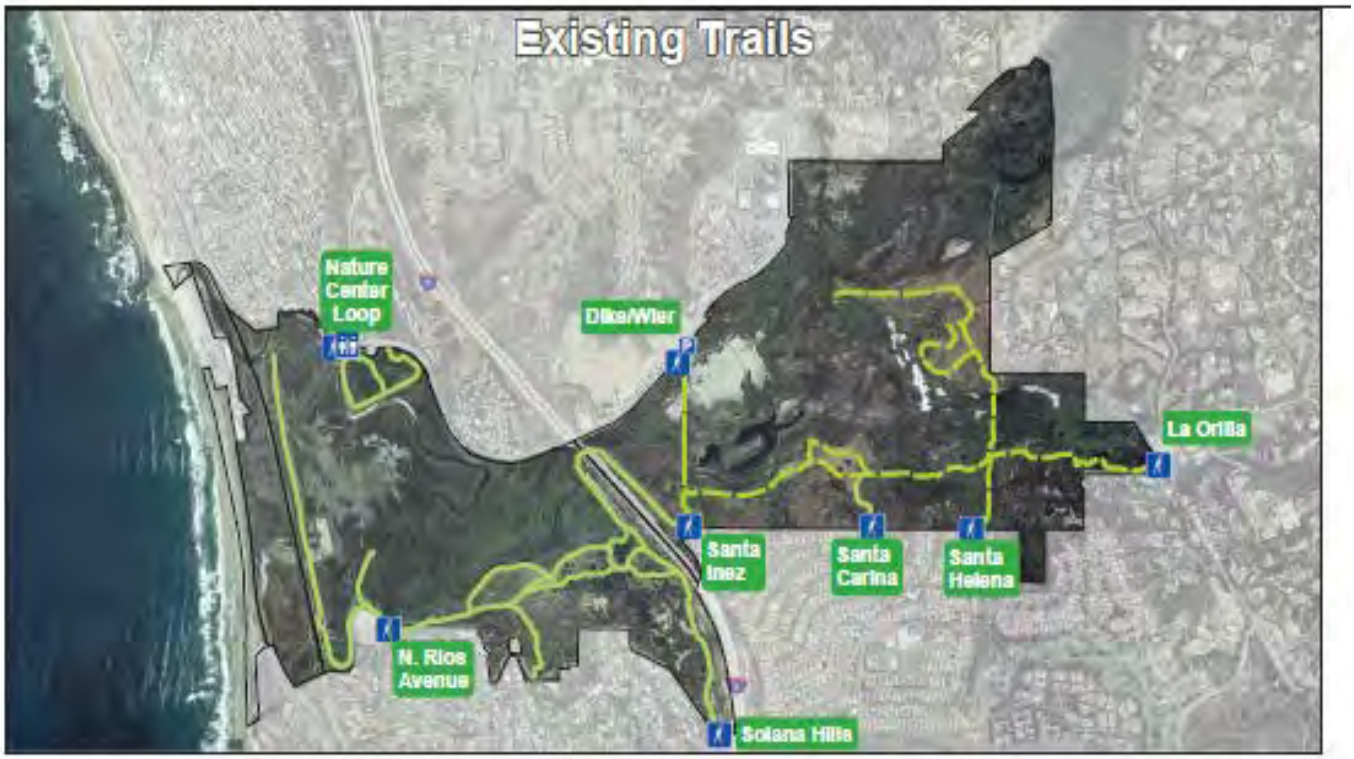
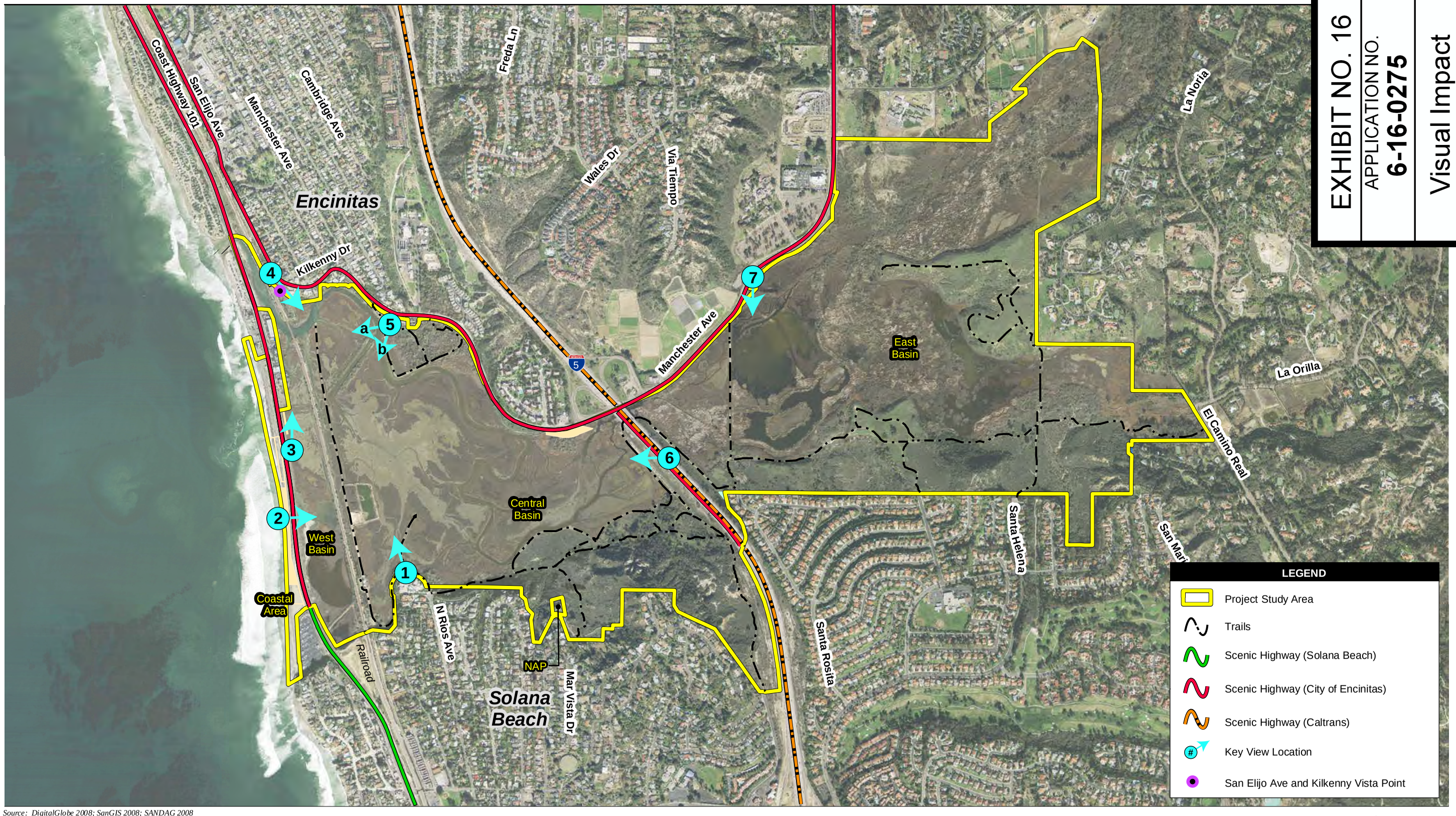


EXHIBIT NO. 15

APPLICATION NO.
6-16-0275

Lagoon Trails

California Coastal Commission



Source: DigitalGlobe 2008; SanGIS 2008; SANDAG 2008

0.25 0.125 0 0.25 Miles

Scale: 1:15,000; 1 inch = 1,250 feet

Figure 3.9-1
Scenic Resources and Location of Key Views

Path: P:\2008\08080046 San Elijo Lagoon Gap Analysis\5GIS\MXD\Alternatives_Development_Report\Study_Area_for_SELRP_ownership.mxd, dbrady 02/14/14

Key View 1 - View from the trail looking north across the central and west basins of the lagoon

Figure 3.9-2
Key View 1 – Trail at North Rios Avenue

Key View 2 – View from Cardiff Beach looking south with Highway 101 to the east

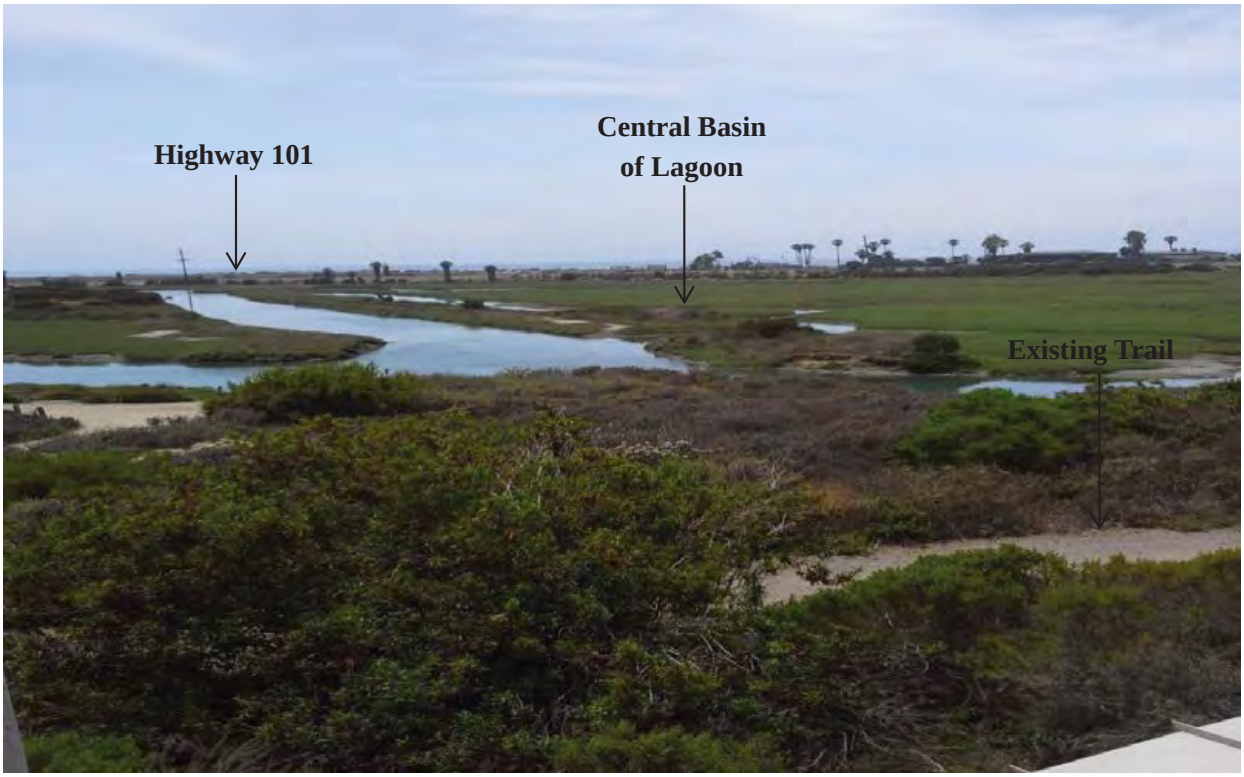
Key View 3 – View from Highway 101 looking north

Figure 3.9-3
Key View 2 and Key View 3

Key View 4 - View looking southwest toward the central and west basins of the lagoon

Figure 3.9-4
Key View 4 –View Point at San Elijo Avenue and Kilkenny Drive

Key View 5a – View from the Nature Center looking northwest



Key View 5b – View from the Nature Center looking southwest

Figure 3.9-5
Key View 5 – Nature Center

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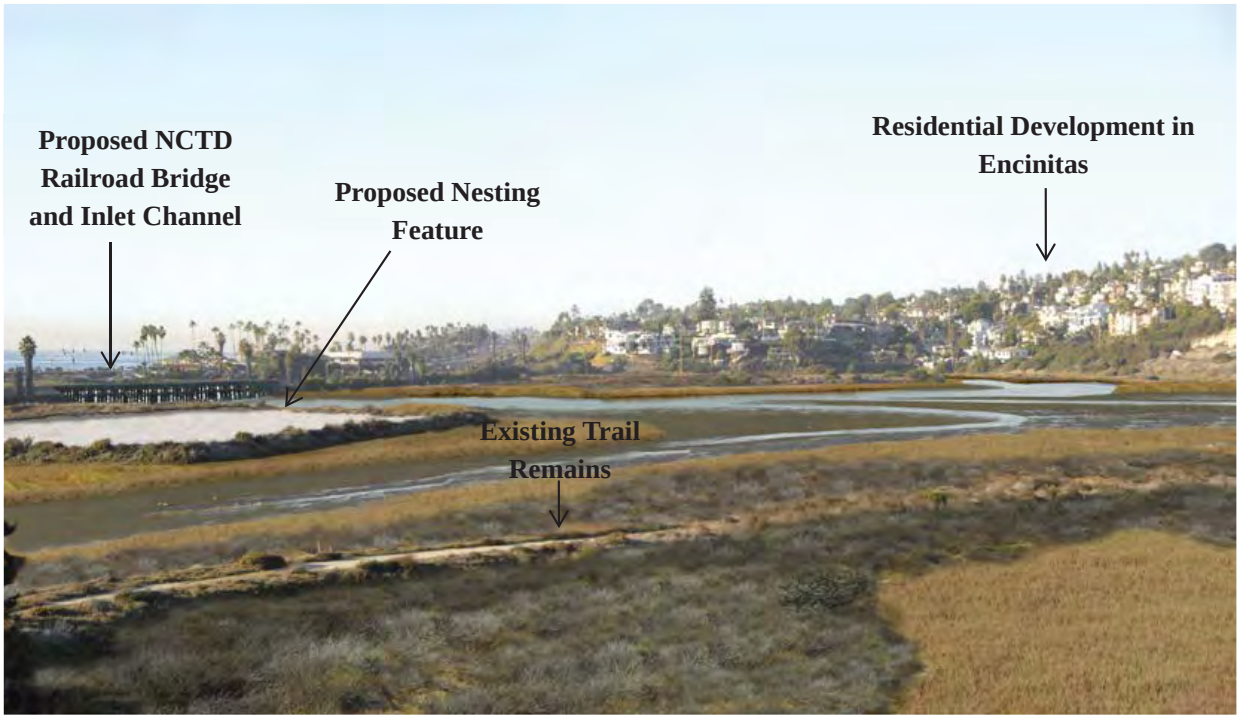
Key View 6 – View from I-5 southbound lanes looking west toward the central basin

Key View 7 – View from Manchester Avenue looking southwest toward the east basin

Figure 3.9-6
Key View 6 and Key View 7

Key View 1 – Existing conditions at North Rios Avenue Trail looking north



Key View 1 – Alternative 2A Visual Simulation

Figure 3.9-7
Alternative 2A Simulation at Key View 1

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Key View 1 – Existing conditions at North Rios Avenue Trail looking north

Key View 1 – Alternative 1B Visual Simulation

Figure 3.9-8
Alternative 1B Simulation at Key View 1

Material Placement Scenarios

TEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community; SanGIS 2012; MoffattNichol 2012

EXHIBIT NO. 17
APPLICATION NO.
6-16-0275
Placement Sites Considered in FEIR
California Coastal Commission