CALIFORNIA COASTAL COMMISSION
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REGULAR CALENDAR
STAFF REPORT AND PRELIMINARY RECOMMENDATION

Application No.: 6-05-134

Applicant: Leucadia National Corp./Joseph Steinberg Agent: Walt Crampton

Description: Construct an approximately 145 ft.-long, 22 ft.-high and 2.5-ft.-wide tiedback concrete seawall to be colored and textured to match the natural surrounding bluff and which includes an approximately 10 ft. high section of backfill behind the seawall that will be colored and textured to match the surrounding bluff. The seawall will be attached on its north side to an existing seawall and will be attached into the natural bluff on its south side and will be located on the beach below two existing single-family residences.

Site: On the beach and bluff below 629 and 633 Circle Drive, Solana Beach, San Diego County. APN 263-021-05 and 253-011-04.

STAFF NOTES:

Summary of Staff's Preliminary Recommendation: Staff is recommending approval of the subject development as the applicant has demonstrated that an existing blufftop residential structure is in danger from erosion. Due to a recent bluff collapse and exposure of the clean sand layer below the residence, the applicant's geotechnical representative has performed a slope stability analysis of the overall site and concluded that the blufftop structure is in danger from erosion. Based on the applicant's geotechnical reports, the seawall and shotcrete fill of the cavity in the face of the mid-bluff are necessary to protect the structures at the top of the bluff. The Commission's staff engineer and geologist have reviewed the applicant's geotechnical assessment and concur with its conclusions.

Staff is recommending special conditions that require the applicant to pay an in-lieu fee of $198,131.74 to mitigate for the impacts to public access and recreational use of the beach from the placement of the seawall on the public beach for 22 years and the resulting loss of recreational value, and an in-lieu fee of $21,420.00 to mitigate for the loss of sand that would have been added to the littoral cell were it not for the proposed seawall. Additional conditions are attached to mitigate the project's impact on coastal resources such as scenic quality and water quality. A special condition has been attached that requires the applicant to acknowledge that, should additional stabilization be proposed in the future, the applicant will be required to identify and address the feasibility of all alternative measures that would avoid additional alteration of the natural landform of the public beach or coastal bluffs, and would reduce the risk to the blufftop structures and provide reasonable use of the property. Other conditions involve the timing of construction, the appearance of the seawall, use of BMP's and approval from other agencies.

Standard of Review: Chapter 3 policies of the Coastal Act

Substantive File Documents: City of Encinitas LCP; City Major Use Permit #01-304; "Geologic Reconnaissance" by Woodward-Clyde Consultants dated June 8, 1990; "Geotechnical Investigation" by TerraCosta Consulting, Inc. dated 12/20/06; "Response to Third Party Review Comments" by TerraCosta Consulting, Inc. dated 9/10/03; "Response to Third Party Review Comments" by TerraCosta Consulting, Inc. dated 3/5/04; "Response to Third Party Review Comments" by TerraCosta Consulting, Inc. dated 10/8/04; Coastal Development Permits Nos. F9818/Blackburn, 6-97-159-G/Blackburn, 6-98-21-G/Blackburn, 6-93-156/Johnson, 6-98-13-G/Johnson, 6-98-137/Johnson; 6-00-9/Del Mar Beach Club, 6-99-100/Presnell (et. al), 6-99-103/ Coastal Preservation Association, 6-00-66/Pierce, Monroe, 6-02-02/Gregg, Santina, 6-02-84/Scism, 6-03-33/Surfsong, 6-04-72/Las Brisas, 6-04-83/Cumming, Johnson and 6-05-119-W/Steinberg.

I. PRELIMINARY STAFF RECOMMENDATION:

The staff recommends the Commission adopt the following resolution:

MOTION: ***I move that the Commission approve Coastal Development Permit No. 6-05-134 pursuant to the staff recommendation.***

STAFF RECOMMENDATION OF APPROVAL:

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

RESOLUTION TO APPROVE THE PERMIT:

The Commission hereby approves a coastal development permit for the proposed development 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.

See attached page.

III. Special Conditions.

The permit is subject to the following conditions:

1. Final Revised Plans. **PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicants shall submit for review and written approval of the Executive Director, final plans for the seawall and backfill in substantial conformance with the submitted plans dated 8/21/03 by TerraCosta Consulting. Said plans shall first be approved by the City of Solana Beach and be revised to include the following:

a. Sufficient detail regarding the construction method and technology utilized for constructing the seawall and backfill so as to gradually blend into the adjacent natural bluff. The south side of the seawall shall be designed and constructed to minimize the erosive effects of the approved seawall on the adjacent bluffs.

b. Sufficient detail regarding the construction method and technology utilized for texturing and coloring the seawall and backfill. Said plans shall confirm, and be of sufficient detail to verify, that the seawall and backfill color and texture closely matches the adjacent natural bluffs, including provision of a color board indicating the color of the seawall and backfill material.

c. Any existing permanent irrigation system located on the bluff top site shall be removed or capped.

d. All runoff from impervious surfaces on the top of the bluff shall be collected and directed away from the bluff edge towards the street.

e. Existing accessory improvements (i.e., decks, patios, walls, etc.) located in the geologic setback area on the site shall be detailed and drawn to scale on the final approved site plan and shall include measurements of the distance between the accessory improvements and the bluff edge (as defined by Section 13577 of the California Code of Regulations) taken at 3 or more locations. The locations for these measurements shall be identified through permanent markers, benchmarks, survey position, written description, or other method that enables accurate determination of the location of structures on the site. All existing and proposed accessory improvements shall be located no closer than 5 feet landward of the natural bluff edge or approved reconstructed bluff edge. **Any existing improvements located within 5 feet landward of the natural bluff edge shall be removed within 60 days of issuance of the coastal development permit.**

The permittees shall undertake the development in accordance with the approved plans. Any proposed changes to the approved plans shall be reported to the Executive Director. No changes to the plans shall occur without a Coastal Commission approved amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

2. Mitigation for Impacts to Public Recreational Use and Sand Supply. **PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicants shall provide evidence, in a form and content acceptable to the Executive Director, that a fee of $219,551.74 ($198,131.74 for loss of recreational value + $21,420.00 for loss of sand) has been deposited in interest bearing accounts designated by the Executive Director, in-lieu of providing the total amount of sand to replace the sand that will be lost due to the impacts of the proposed protective structure and to mitigate for the loss of public recreational use over 22 years resulting from effects associated with the placement of the structure on the public beach at the toe of the natural bluffs. All interest earned by the accounts shall be payable to the account for the purposes stated below.

The required in-lieu fee mitigation covers impacts only through the identified 22-year design life of the seawall. No later than 21 years after the issuance of this permit, the permittees or their successor in interest shall apply for and obtain an amendment to this permit that either requires the removal of the seawall within its initial design life or requires mitigation for the effects of the seawall on shoreline sand supply and public recreational use, for the expected life of the seawall beyond the initial 22-year design life. If within the initial design life of the seawall the permittees or their successor in interest obtain a coastal development permit or an amendment to this permit to enlarge or reconstruct the seawall or perform repair work that extends the expected life of the seawall, the permittee shall provide mitigation for the effects of the additional size of the

seawall or the extended effects of the existing seawall on shoreline sand supply and public recreational use for the expected life of the seawall beyond the initial 22-year design life.

The purpose of the accounts shall be to establish a beach sand replenishment fund to aid SANDAG, or a Commission-approved alternate entity, in the restoration of the beaches within San Diego County and to provide public access and recreational improvements. The funds shall be used solely to implement projects which provide sand to the region's beaches and/or to construct public access and recreational improvements; not to fund operations, maintenance or planning studies. The funds shall be released only upon approval of an appropriate project by the Executive Director of the Coastal Commission. The funds shall be released as provided for in MOA's between SANDAG, or a Commission-approved alternate entity, and the Commission, setting forth terms and conditions to assure that the in-lieu fee will be expended in the manner intended by the Commission. If any MOA is terminated, the Executive Director may appoint an alternative entity to administer the funds.

4. Monitoring Program. **PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicants shall submit to the Executive Director for review and written approval, a monitoring program prepared by a licensed civil engineer or geotechnical engineer to monitor the performance of the seawall which requires the following:

a. An annual evaluation of the condition and performance of the seawall and backfill addressing whether any significant weathering or damage has occurred that would adversely impact the future performance of the structures. This evaluation shall include an assessment of the color and texture of the structures comparing the appearance of the structures to the surrounding native bluffs.

b. Annual measurements of any differential retreat between the natural bluff face and the seawall face, at the south end of the seawall and at 20-foot intervals (maximum) along the top of the seawall face/bluff face intersection. The program shall describe the method by which such measurements shall be taken.

c. Provisions for submittal of a report to the Executive Director of the Coastal Commission by May 1 of each year (beginning the first year after construction of the project is completed) for a period of three years and then, each third year following the last the annual report, for the life of the approved seawall. However, reports shall be submitted in the Spring immediately following either:

1. An "El Niño" storm event – comparable to or greater than a 20-year storm.

2. An earthquake of magnitude 5.5 or greater with an epicenter in San Diego County.

Thus reports may be submitted more frequently depending on the occurrence of the above events in any given year.

d. Each report shall be prepared by a licensed civil, geotechnical engineer or geologist. The report shall contain the measurements and evaluation required in sections a and b above. The report shall also summarize all measurements and analyze trends such as erosion of the bluffs or changes in sea level and the stability of the overall bluff face, including the upper bluff area, and the impact of the seawall on the bluffs adjacent to the south end of the wall. In addition, each report shall contain recommendations, if any, for necessary maintenance, repair, changes or modifications to the project.

e. An agreement that the permittee shall apply for a coastal development permit within 90 days of submission of the report required in subsection c. above for any necessary maintenance, repair, changes or modifications to the project recommended by the report that require a coastal development permit.

The permittee shall undertake monitoring in accordance with the approved monitoring program. Any proposed changes to the approved monitoring program shall be reported to the Executive Director. No changes to the monitoring program shall occur without a Coastal Commission approved amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

5. Best Management Practices. **PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicants shall submit for review and written approval of the Executive Director, a Best Management Plan that effectively assures no shotcrete or other construction byproduct will be allowed onto the sandy beach and/or allowed to enter into coastal waters. The Plan shall apply to both concrete pouring/pumping activities as well as shotcrete/concrete application activities. During shotcrete/concrete application specifically, the Plan shall at a minimum provide for all shotcrete/concrete to be contained through the use of tarps or similar barriers that completely enclose the application area and that prevent shotcrete/concrete contact with beach sands and/or coastal waters. All shotcrete and other construction byproduct shall be properly collected and disposed of off-site.

The applicant shall undertake the development in accordance with the approved Plan. Any proposed changes to the approved Plan shall be reported to the Executive Director. No changes to the Plan shall occur without a Coastal Commission approved amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

6. Storage and Staging Areas/Access Corridors. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director for review and written approval, final plans indicating the location of access corridors to the construction site and staging areas. The final plans shall indicate that:

a. No overnight storage of equipment or materials shall occur on sandy beach. During the construction stages of the project, the permittee shall not store any construction materials or waste where it will be or could potentially be subject to wave erosion and dispersion. In addition, no machinery shall be placed, stored or otherwise located in the intertidal zone at any time, except for the minimum necessary to construct the notch fill. Construction equipment shall not be washed on the beach or in the South Cardiff State Beach parking lot.

b. Access corridors shall be located in a manner that has the least impact on public access to and along the shoreline.

c. No work shall occur on the beach on weekends, holidays or between Memorial Day weekend and Labor Day of any year.

d. The applicant shall submit evidence that the approved plans/notes have been incorporated into construction bid documents. The staging site shall be removed and/or restored immediately following completion of the development.

The permittee shall undertake the development in accordance with the approved plans. Any proposed changes to the approved plans shall be reported to the Executive Director. No changes to the plans shall occur without a Coastal Commission approved amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

7. Storm Design/Certified Plans. **PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicant shall submit certification by a registered civil engineer that the proposed shoreline protective devices are designed to withstand storms comparable to the winter storms of 1982-83.

In addition, **within 60 days following construction**, the permittee shall submit certification by a registered civil engineer, acceptable to the Executive Director, verifying the seawall and backfill have been constructed in conformance with the approved plans for the project. These plans shall also show the elevations of the clean sand lens along the bluff face and the contacts of this lens with the Torrey Formation and terrace deposits.

8. Future Response to Erosion. If in the future the permittees seek a coastal development permit to construct additional bluff or shoreline protective devices, the permittees will be required to include in the permit application information concerning alternatives to the proposed bluff or shoreline protection that will eliminate impacts to scenic visual resources, recreation and shoreline processes. Alternatives shall include but not be limited to: relocation of all or portions of the principle structure that are threatened, structural underpinning, and other remedial measures capable of protecting the principal structure and providing reasonable use of the property, without constructing

bluff or shoreline stabilization devices. The information concerning these alternatives must be sufficiently detailed to enable the Coastal Commission or the applicable certified local government to evaluate the feasibility of each alternative, and whether each alternative is capable of protecting existing structures that are in danger from erosion. No additional bluff or shoreline protective devices shall be constructed on the adjacent public bluff face above the approved seawall or on the beach in front of the proposed seawall unless the alternatives required above are demonstrated to be infeasible. No shoreline protective devices shall be constructed in order to protect ancillary improvements (patios, decks, fences, landscaping, etc.) located between the principal residential structures and the ocean.

9. Future Maintenance. The permittee shall maintain the permitted seawall and backfill in its approved state. Maintenance of all the structures shall include maintaining the color, texture and integrity. Any change in the design of the project or future additions/reinforcement of the approved structures beyond exempt maintenance as defined in Section 13252 of the California Code of Regulations to restore the structure to its original condition as approved herein, will require a coastal development permit. **However, if (after inspection) it is apparent that repair and maintenance is necessary, including maintenance of the color of the structure to ensure a continued match with the surrounding native bluffs, the permittee shall contact the Executive Director to determine whether a coastal development permit or an amendment to this permit is legally required, and, if required, shall subsequently apply for a coastal development permit or permit amendment for the required maintenance.**

10. Other Permits. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall provide to the Executive Director copies of all other required local, state or federal discretionary permits for the development authorized by CDP #6-05-134. The applicant shall inform the Executive Director of any changes to the project required by other local, state or federal agencies. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this permit, unless the Executive Director determines that no amendment is legally required.

11. State Lands Commission/California State Parks and Recreation Approval. **PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicants shall submit to the Executive Director for review and written approval, a written determination from the State Lands Commission and California State Parks that:

a) No state lands or State Parks lands are involved in the development; or

b) State lands or State Parks lands are involved in the development, and all permits required by the State Lands Commission and State Parks have been obtained.

c) For State Lands Commission, a determination that State lands may be involved in the development, but pending a final determination of state lands involvement, an agreement has been made by the applicant with the State Lands Commission for the

project to proceed without prejudice to the determination of whether permits are necessary.

12. Public Rights. The Coastal Commission's approval of this permit shall not constitute a waiver of any public rights that exist or may exist on the property. The permittee shall not use this permit as evidence of a waiver of any public rights that exist or may exist on the property.

13. Assumption of Risk, Waiver of Liability and Indemnity Agreement. By acceptance of this permit, the applicant acknowledges and agrees (i) that the site may be subject to hazards from erosion and coastal bluff collapse; (ii) to assume the risks to the applicant 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.

14. Deed Restriction. **PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicants shall submit to the Executive Director for review and approval documentation demonstrating that the landowners have executed and recorded a deed restriction, in a form and content acceptable to the Executive Director: (1) indicating that, pursuant to this permit, the California Coastal Commission has authorized development on the subject property, subject to terms and conditions that restrict the use and enjoyment of that property (hereinafter referred to as the "Standard and Special Conditions"); and (2) imposing all Standard and Special Conditions of this permit as covenants, conditions and restrictions on the use and enjoyment of the Property. The deed restriction shall include a legal description of the applicant's entire parcel or parcels. The deed restriction shall also indicate that, in the event of an extinguishment or termination of the deed restriction for any reason, the terms and conditions of this permit shall continue to restrict the use and enjoyment of the subject property so long as either this permit or the development it authorizes, or any part, modification, or amendment thereof, remains in existence on or with respect to the subject property.

IV. Findings and Declarations.

The Commission finds and declares as follows:

1. Detailed Project Description\Permit History. Proposed is the construction of an approximately 145 ft.-long, 22 ft. high, 2.5 ft.-wide colored and textured concrete tiedback seawall (and an approximately 10 ft. high layer of concrete backfill above the seawall) on the public beach below two residential structures at 629 and 633 W. Circle Drive in the City of Solana Beach. While the seawall will be located on beach fronting a portion of the residence at 629 W. Circle Drive, the seawall is primarily designed as

protection for the residence at 633 W. Circle Drive located to the north. The seawall will be attached on its north side to an existing approximately 160 ft.-long seawall that the applicant constructed in approximately 1988 to protect a residence he also owns immediately to the north at 645 W. Circle Drive. On the south side of the proposed seawall, the applicant proposes to connect the end of the seawall into the existing natural bluff. The applicant proposes to pay an in-lieu fee to mitigate the adverse effects of the shoreline protective devices on the local sand supply, but has not proposed mitigation for the adverse impacts the seawall may have recreational use or public access.

The existing approximately 3,314 sq. ft. single-family residence at 633 W. Circle Drive was constructed in approximately 1965. In 1991, the Commission approved a 598 sq. ft. addition to the residence, but the applicant eventually only added an approximately 277 sq. ft. garage addition located on east side of the residence (Ref. 6-91-129/Steinberg). In the 1991, the applicant's geotechnical report identified that the residence was located approximately 15 feet from the edge of the bluff and that the addition located more than 40 ft. from the edge of the bluff would not require shoreline protection over its lifetime (Ref. "Geologic Reconnaissance" by Woodward-Clyde Consultants dated June 8, 1990). Special conditions of approval for the addition included requirements that the applicant receive quitclaim ownership of the bluff face from the City of Solana Beach, the bluff face be conserved with a open space deed restriction prohibiting future development on the bluff unless authorized by a subsequent coastal permit, and that, in the event erosion threatens the patio or accessory structures in the future, their removal would be considered preferable to their protection. The applicant subsequently received ownership of the bluff face and recorded the open space deed restriction. In December 2002, the Executive Director approved an emergency permit for the construction of approximately 15 ft.-long concrete fill on both the north and south ends of an existing seawall that is located immediately north of the subject site to prevent the seawall from being outflanked by erosion (Ref. Emergency Permit #6-02-144/Steinberg). The emergency permit also authorized the fill of a bluff face cavity ("mole hole") using colored and textured concrete fill on the bluff below 629 W. Circle Drive located on the south. The proposed 145 ft.-long seawall will attach to the northern seawall and will effectively cover over the approximately 15 ft. of concrete fill placed at the south end of the existing seawall pursuant to the emergency permit. In addition, the City of Encinitas recently approved the follow-up regular coastal development permit for the fill of the "mole hole" since the bluff face at this location lies within the City's permit jurisdiction and a Major Use Permit for the "mole hole" fill and construction of the subject seawall (Ref. Encinitas MUP/CDP #01-304). Finally, in 2005, the Commission waived the permit requirements for the applicant to replace an existing wooden fence located 30 ft. from the bluff edge (Ref. CDP #6-05-119-W/Steinberg).

The proposed project will be located approximately 400 feet south of the parking lot for South Cardiff State Beach in the City of Encinitas. The "mole hole" fill which is located on the bluff face and the seawall which is located on the beach are both located within the City of Encinitas. However, the homes at the top the bluff are located within the City of Solana Beach. In addition, the proposed seawall will be located on a section of beach

owned by California State Parks and Recreation within the Commission's original jurisdiction. Therefore, Chapter 3 policies of the Coastal Act is the standard of review.

2. Geologic Conditions and Hazards. Section 30235 of the Coastal Act states, in part:

> 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.

In addition, Section 30253 of the Coastal Act states, in part:

> New development shall:
>
> (l) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.
>
> (2) 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...

The proposed project involves the construction of an approximately 145 ft.-long, 22 ft.-high tiedback seawall to protect an existing residence at the top of an approximately 65 ft. high coastal bluff that is threatened by erosion. The applicant's geotechnical report identifies that a coastal bluff headland lies immediately west of the residence which curves inland toward the southwest corner of the residence forming a small pocket beach below the southwest corner of the residence. As a result, the existing residence is located approximately 35 ft. from the bluff edge on its northwest corner and approximately 9 ft. from the bluff edge on its southwest corner. According to the applicant's report, this section of the shoreline been subject to increased erosion over the last decade due to a number of factors including the loss of sand which subjects the bluff face to direct wave attack (Ref. "Geotechnical Investigation" by TerraCosta Consulting, Inc. dated 12/20/06). In the 1997-98 El Nino storm season, the Solana Beach Shoreline experienced approximately 8 to 10 feet of coastal erosion resulting in the formation of seacaves or notches. The applicant's geotechnical report identifies seacaves and notches "extend across much of the lower bluff in front of 633 Circle Drive, and a seacave can be seen approximately 80 ft. south of the southwest corner of the existing seawall." The report identifies that these notches and seacave will eventually collapse, undermining the upper terrace deposits and triggering upper-bluff failures. In addition, the report identifies that "fault controlled shears and joints" are present in the bluff below the subject site which has allowed for up to 9 ft. of sea-cliff retreat immediately beneath the northwest corner of the subject property in the past decade. In addition, the report identifies the presence of a 10 ft.-thick layer of clean sands immediately above the Torrey Sandstone which extends

at least 80 ft. landward of bluff face. Unless this layer of clean sands is contained by the seawall "their presence will encourage both landward and lateral expansion of the upper-bluff failure."

According to the Commission's staff geologist, the clean sand lens consists of a layer of sand with a limited amount of capillary tension and a very minor amount of cohesion, which causes the material to erode easily, making this clean sand layer, once exposed, susceptible to wind blown erosion and continued sloughing as the sand dries out and loses the capillary tension that initially held the materials together. Geotechnical reports associated with developments near this site have stated that gentle sea breezes and any other perturbations, such as landing birds or vibrations from low-flying helicopters, can be sufficient triggers of small- or large-volume bluff collapses, since the loss of the clean sands eliminates the support for the overlying, slightly more cemented, terrace deposits.

The presence of this clean sand layer within the bluffs along the Solana Beach shoreline has previously been identified in geotechnical reports submitted in conjunction with seawall, seacave and notch infill projects in Solana Beach (ref. CDP 6-00-9/Del Mar Beach Club, CDP #6-99-100/Presnell, et. al, #6-99-103/ Coastal Preservation Association, #6-00-66/Pierce, Monroe, #6-02-02/Gregg, Santina, #6-02-84/Scism; #6-03-33/Surfsong and #6-04-083Cumming, Johnson). According to the Commission's staff geologist, the typical mechanism of sea cliff retreat along the Solana Beach shoreline involves the slow abrasion and undercutting of the Torrey Sandstone bedrock, which forms the sea cliff at the base of the bluffs, from wave action which becomes more pronounced in periods of storms, high surf and high tides. Other contributing factors to sea cliff retreat include fracturing, jointing, sea cave and overhang collapse and the lack of sand along the shoreline. When the lower sea cliff is undercut sufficiently, it commonly fails in blocks. The weaker terrace deposits are then unsupported, resulting in the collapse of the terrace deposits through circular failures. Such paired, episodic failures eventually result in a reduction in the steepness of the upper bluff, and the landward retreat of the bluff edge. Such retreat may threaten structures at the top of the slope. When failures of the upper bluff have sufficiently reduced the overall gradient of the upper bluff, a period of relative stability ensues, which persists until the lower bluff becomes sufficiently undercut to initiate a block failure once more, triggering a repetition of the entire process.

The mechanism of bluff retreat that occurs in conjunction with the exposure of the clean sand layer is somewhat different than the paired, episodic failure model described above. Because of the cohesionless character of the clean sands, once they are exposed, they continue to slump on an ongoing basis as a result of very small triggers such as traffic vibrations or wind erosion. Continued sloughage results in the further exposure of more clean sand, and ongoing upper bluff collapse. This cycle occurs so quickly (over months or days, rather than years) that the upper bluff may never achieve a stable angle of repose. In 1998, following the exposure of the clean sands layer below 261 Pacific Avenue (south of the subject site), a section of the bluff collapsed suddenly and without warning, leaving a vertical head scarp 25 feet in height at the top of the bluff.

The proposed approximately 145 ft. long seawall will be approximately 22 ft. in height and will include an approximately 10 ft. of colored and textured erodible concrete backfill that will lie back from the top of the seawall against the bluff face in order to cover any exposed sections of the clean sands layer or to prevent its exposure. Unless the base of the bluff is afforded shoreline protection, additional bluff failures can further expose the layer of clean sands and result in a potential upper bluff failure and an immediate threat to the structures at the top of the bluff:

> It is the ongoing sloughening of the clean sands in the upper bluff that constitutes the immediate threat to the bluff top structure and any solution that does not address this mechanism is inadequate. (Page 25, "Geotechnical Investigation" by TerraCosta Consulting, Inc. 12/20/01)

The applicant's geotechnical report documents that slope stability analysis for the site indicates that further collapse of the upper bluff will threaten the residence at the top of the bluff. The factor of safety against sliding along the most likely slide plane was estimated to be at approximately 1.0. (The factor of safety is an indicator of slope stability where a value of 1.5 is the industry-standard value for new development. In theory, failure should occur when the factor of safety drops to 1.0, and no slope should have a factor of safety less than 1.0.) With the construction of the proposed seawall and concrete backfill, the applicant's slope stability analysis identifies the factor of safety will increase to only about 1.2. The report identifies that following the construction of the seawall, the clean sands layer will be covered such that upper failures affecting the residence will be arrested. However, the seawall will not eliminate ongoing upper failures entirely. The report identifies that the area above the seawall on the north side of the residence will continue to sloughen until a stable angle of repose occurs. This will likely result in the loss of approximately 20 feet of the upper bluff top, but will not likely threaten the residence which lies approximately 35 ft. from the bluff edge at that location. With the toe of bluff stabilized by the seawall, the applicant's engineer has identified that any future failures of the mid and upper bluff on both its northwest and southwest locations will not likely threaten the residence.

Thus, given the significant bluff collapses that have occurred since 1998, the presence of the clean sand layer, the extreme erodibility of these sands once exposed, and the low factor of safety on the subject bluff, substantial evidence has been provided to document that the existing primary blufftop structure is in danger from erosion. However, there are a variety of ways in which the threat from erosion could be addressed. Under the policies of the Coastal Act, the project must eliminate or mitigate adverse effects on shoreline sand supply and minimize adverse effects on public access, recreation, and the visual quality of the shoreline.

Alternatives

The applicant's engineer has performed an alternatives analysis to demonstrate that no other feasible less-enviromentally-damaging alternatives exist to address the threats to the structure at the top of the bluff. The applicant's engineer has identified that removal or

relocation of the residential structure is not feasible or practical because of the expense and the lack of available area on the lots to setback the structures so as to not be threatened by the ongoing erosion. Maintenance of the existing seacave/notch fills will also not effectively protect the residence. Upper bluff failures have occurred exposing the clean sands lens even with concrete fill of the seacaves/notches. Control of groundwater and irrigation restriction, while recommended by the applicants' representative as a way of reducing bluff sloughage, will not prevent the bluff collapses that occur at the subject site. Underpinning of the existing residences has also been examined by the applicant; however, without controlling the ongoing failures, the underpinnings would soon be exposed. In the case of the seawall, the applicant's engineer has also identified that the height of the wall at 22 ft. is the minimum size necessary to protect the toe of the bluff from marine erosion. The approximately 10 ft. high concrete backfill will contain the layer of clean sands which has been determined to be located in the mid-bluff above the proposed seawall.

In summary, the exposure of the clean sands layer presents a threat of rapid erosion and bluff collapse that must be addressed by a solution that effectively contains the clean sands and affords protection to the residence at the top of the bluff. Given the substantial amount of documented erosion on the site over the last few years, the presence of the clean sands, the extreme erodibility of these sands, and the low factor of safety on the subject bluffs, substantial evidence has been provided to document that the existing primary blufftop structures are in danger from erosion and that the proposed seawall and concrete backfill are necessary to protect the structure at the top of the bluff from the danger of erosion. In addition, the above-described alternatives presented by the applicant do not suggest there is a less-environmentally-damaging feasible alternative. The Commission's staff geologist and coastal engineer have reviewed the applicant's geotechnical assessment of the site along with their alternatives analysis and concur with its conclusions and recommendations. Therefore, the Commission finds that the proposed seawall and concrete backfill structures are the least environmentally damaging feasible alternative.

Sand Supply/In Lieu Mitigation Fee

Although construction of a seawall is required to protect the existing principle structures on the site, Section 30235 of the Coastal Act requires that the shoreline protection be designed to eliminate or mitigate adverse impacts on local shoreline sand supply. There are a number of adverse impacts to public resources associated with the construction of shoreline protection. The natural shoreline processes referenced in Section 30235, such as the formation and retention of sandy beaches, can be significantly altered by construction of a seawall, since bluff retreat is one of several ways that beach area and beach quality sand is added to the shoreline. This retreat is a natural process resulting from many different factors such as, erosion by wave action causing cave formation, enlargement and eventual collapse, saturation of the bluff soil from ground water causing the bluff to slough off, and natural bluff deterioration. When a seawall is constructed on the beach at the toe of the bluff, it directly impedes these natural processes.

Some of the effects of a shoreline protective structure on the beach such as scour, end effects and modification to the beach profile are temporary or difficult to distinguish from all the other actions which modify the shoreline. Seawalls also have non-quantifiable effects to the character of the shoreline and visual quality. However, some of the effects that a structure may have on natural shoreline processes can be quantified. Three of the effects from a shoreline protective device which can be quantified are: 1) loss of the beach area on which the structure is located; 2) the long-term loss of beach which will result when the back beach location is fixed on an eroding shoreline; and 3) the amount of material which would have been supplied to the beach if the back beach or bluff were to erode naturally.

Based upon the provided engineering plans, the proposed seawall will be 145 feet long and will encroach 2.5 feet onto the beach. The total beach encroachment that will occur from the proposed seawall will be 362.5 square feet of beach area that will no longer be available for public use. In addition, if the natural shoreline were to be allowed to erode, the beach would retreat inland and a narrow beach would persist seaward of the back bluff. However, when the back shoreline location is fixed, the inland migration of the beach is halted. This will result in a long-term loss of recreational opportunity as the development of new inland beach land fails to keep pace with the loss of or inundation of the seaward portion of the beach.

In the supporting material for this shoreline protection device (Ref. "Response to Third Party Review Comments" by TerraCosta Consulting Group dated September 10, 2003, Page 9), the applicant provided information that the average long-term erosion rate at this location would be 0.4 feet per year. In the calculations of the proposed in-lieu sand fee, the applicant used an average long-term erosion rate if 0.3 feet per year (noting that he was using what he thought the Commission was requiring). The Commission consistently uses the same erosion rate that is used to document the need for the project as the rate that would typify the impacts from proposed armoring that would halt this same shoreline erosion, the analysis of the mitigation has been adjusted to use the 0.4 erosion rate initially provided by the applicant. Also, the applicant has provided assurance to the City of Encinitas that the proposed seawall should remain as a protective structure for 75 years. Most other shoreline protection projects in the Oceanside Littoral Cell that have been brought before the Commission, have identified that they have been designed to be stable for 20 to 25 years. The average of 22 years has been used for more projects. In calculating the mitigation fee, the applicant provided a project life of 30 years (again noting that this is what the applicant thought was being required by the Commission) For the sake of consistency with other projects in the area and since the applicant seems to have a range of project lifes that are possible, the average project lifespans of 22 years is being used for this project.

Thus, over a 22-year period, with a long-term average annual retreat rate of 0.4 ft/yr (for the 145 ft.-long seawall), 1,276 square feet of beach will be inundated and will not be replaced by new inland beach area. These two impacts from the seawall, the encroachment and the fixing of the back beach, will result in the immediate loss of 362.5

square feet of beach and the on-going loss of beach area that, after 22 years (1,276 sq. ft.) will total 1,638.5 square feet.

The proposed seawall will also halt or slow the retreat of the entire bluff face. The bluff consists of a significant amount of sand, in the form of terrace deposits, the clean sand lens and the lower sandstone bedrock layer. As the bluff retreated historically, this sand was contributed to the littoral sand supply to nourish beaches throughout the region. The proposed seawall will halt this contribution to the littoral cell. Based on bluff geometry and the composition of the terrace materials, the applicant has estimated that the seawall will prevent 1,530 cubic yards of sand from reaching the littoral cell (based on a bluff erosion rate of 0.4 ft/yr and the wall remaining in place for 22 years).

The project impacts, the loss of 1,530 cubic yards of beach material and the eventual loss of 1,638.6 square feet of beach area, are two separate concerns. A beach is the result of both sandy material and a physical area between the water and the back beach. Thus, beach area is not simply a factor of the quantity of sandy beach material. In Solana Beach, the shoreline is a shallow bedrock layer covered by a thin veneer of sand. The bedrock layer provides an area for collection of sandy material. The sand material is important to the overall beach experience, but even without the sand, the bedrock layer provides an area for coastal access between the coastal bluff and the ocean. The loss of beach material that will be a direct result of this project can be balanced or mitigated by obtaining similar quality and quantity of sediment from outside the littoral cell and adding this sediment to the littoral cell. There are sources of beach quality sediment that can be drawn upon to obtain new sediment for the littoral cell.

For the past decade, the Commission has also relied upon the Beach Sand In-Lieu Mitigation Program to address impacts to local sand supply and some of the impacts from the loss of beach area[1]. The Beach Sand In-Lieu Fee Mitigation Program was established to mitigate for small, persistent losses of recreational beach and has been administered by the San Diego Association of Governments (SANDAG) for many years. The

[1] The above-described impacts on the beach and sand supply have previously been found to result from seawalls in other areas of North County. In March of 1993, the Commission approved CDP #6-93-85/Auerbach, et al for the construction of a seawall fronting six non-continuous properties located in the City of Encinitas north of the subject site. In its finding for approval, the Commission found the proposed shoreline protection would have specific adverse impacts on the beach and sand supply and required mitigation for such impacts as a condition of approval. The Commission made a similar finding for several other seawall developments within San Diego County including an August 1999 approval (ref. CDP No. 6-99-100/Presnell, et. al) for the approximately 352-foot-long seawall project located approximately ¼ mile south of the subject development and a March 2003 approval (ref. CDP No. 6-02-84/Scism located 2 lots south of the subject site. (Also ref. CDP Nos. 6-93-36-G/Clayton, 6-93-131/Richards, et al, 6-93-136/Favero, 6-95-66/Hann, 6-98-39/Denver/Canter and 6-99-41/Bradley; 6-00-138/Kinzel, Greenberg; 6-02-02/Gregg, Santina and 6-03-33/Surfsong).

Commission has long recognized that while beach nourishment can address some of the losses that are directly attributable to seawall projects, the one-time provision of beach through nourishment does not adequately address the long-term and persistent impacts from encroachment and fixing the back of the beach. The main coastal resource concerns for these impacts arise from the losses in recreational use and recreational value that result from loss of available shoreline area. As discussed in the section on Recreation below, these impacts can better be addressed as a loss of recreational value.

The applicant has proposed to make a contribution to the mitigation program that would address the sand volume impacts from the wall and infill encroachments, denial of sand to the littoral cell and passive erosion (from the back of the beach), as discussed herein. The applicant applied the calculations that the Commission has used for the past decade to estimate mitigation for these three impacts. However, the Commission finds the impacts from beach encroachment and fixing the back beach should be addressed through estimates for lost recreational values. The In-Lieu Beach Sand Mitigation calculations should only address the value of the sand that will be lost from the littoral cell due to the construction of the proposed seawall. The amount of beach material that would have been added to the beach if natural erosion had been allowed to continue at the site has been calculated to be 1,530 cubic yards. At an estimated sand cost of $14 a cubic yard (provided by the applicant), this would have a value of $21,420. Special Condition #2 requires the applicant to deposit an in-lieu fee of $21,420 to fund beach sand replenishment of 1,530 cubic yards of sand, as mitigation for the direct impacts of the proposed shoreline protective device on beach sand supply and shoreline processes over the 22-year design life of the project.

Special Condition #2 also requires the applicant to amend the subject permit before the end of the 22-year design life so as to either remove the seawall or extend the mitigation fee based on the expected extended life of the seawall.

The applicant is being required to pay a fee in-lieu of directly depositing the sand on the beach, because the benefit/cost ratio of such an approach would be too low. Many of the adverse effects of the seawall on sand supply will occur gradually. In addition, the adverse effects impact the entire littoral cell but to different degrees in different locations throughout the cell (based upon wave action, submarine canyons, etc.) Therefore, mitigation of the adverse effects on sand supply is most effective if it is part of a larger project that can take advantage of the economies of scale and result in quantities of sand at appropriate locations in the affected littoral cell in which it is located. The funds will be used only to implement projects which benefit the area where the fee was derived, and provide sand to the region's beaches, not to fund operations, maintenance or planning studies. Such a fund will aid in the long-term goal of increasing the sand supply and thereby reduce the need for additional armoring of the shoreline in the future. The fund also will insure available sandy beach for recreational uses. The methodology, as proposed, ensures that the fee is roughly proportional to the impacts to sand supply attributable to the proposed seawall. The methodology provides a means to quantify the sand and beach area that would be available for public use, were it not for the presence of the seawall.

In addition to the adverse impacts the seawall will have on the beach as detailed above, the Commission finds that the proposed seawall could also have adverse impacts on adjacent unprotected properties caused by wave reflection, which leads to accelerated erosion. Numerous studies have indicated that when continuous protection is not provided, unprotected adjacent properties experience a greater retreat rate than would occur if the protective device were not present. This is due primarily to wave reflection off the protective structure and from increased turbulence at the terminus of the seawall. According to James F. Tait and Gary B. Griggs in Beach Response to the Presence of a Seawall (A Comparison of Field Observations) "[t]he most prominent example of lasting impacts of seawalls on the shore is the creation of end scour via updrift sand impoundment and downdrift wave reflection. Such end scour exposes the back beach, bluff, or dune areas to higher swash energies and wave erosion." As such, as the base of the bluff continues to erode on the unprotected adjacent properties, failure of the bluff is likely. Thus, future failures could "spill over" onto other adjacent unprotected properties, prompting requests for much more substantial and environmentally damaging seawalls to protect the residences. This then starts a "domino" effect of individual requests for protection.

According to information contained in the Planners Handbook (dated March 1993), which is included as Technical Appendix III of the Shoreline Preservation Strategy adopted by the San Diego Association of Governments (SANDAG) on October 10, 1993, "[a] longer return wall will increase the magnitude of the reflected wave energy. On a coast where the shoreline is retreating, there will be strong incentives to extend the length of the return wall landward as adjacent property is eroded, thereby increasing the return wall, and its effects on neighboring property, with time."

The plans for the subject seawall submitted by the applicant do not address the design of south end of the seawall in terms of how the design will mitigate these known effects. Therefore, Special Condition #1 has been attached which requires the submission of revised final plans that reflect the end design of the proposed seawall. The condition requires that the returns incorporate a feathered design or other design to gradually blend into the adjacent natural bluffs which will help to reduce the turbulence at the end of the wall that can lead to accelerated erosion of adjacent unprotected bluffs. However, although the proposed seawall must be designed to reduce impacts of the wall on adjacent properties, at best, the impacts can be reduced, but not eliminated. Regardless of whether accelerated erosion will occur on the adjacent unprotected properties, the adjacent bluffs will continue to erode due to the same forces that are causing them to erode currently. As this occurs, more surface area of the feathered edges will be exposed to wave attack leading to increased turbulence and accelerated erosion of the adjacent unprotected bluff.

If the proposed wall were damaged in the future (e.g. as a result of wave action, storms, etc.) it could threaten the stability of the site, which could lead to need for more bluff alteration. In addition, damage to the seawall could adversely affect the beach by resulting in debris on the beach and/or creating a hazard to the public using the beach. In

addition, excessive wear of the seawall could result in the loss of or damage to the color or texture of the seawall resulting in adverse visual impacts (discussed in more detail in a subsequent section of this report). Therefore, in order to find the proposed seawall consistent with the Coastal Act, the Commission finds that the condition of the seawall in its approved state must be maintained for the life of the seawall. Further, in order to ensure that the permittee and the Commission know when repairs or maintenance are required, the permittee must monitor the condition of the seawall annually, for three years and at three-year intervals after that, unless a major storm event occurs. The monitoring will ensure that the permittee and the Commission are aware of any damage to or weathering of the seawall wall and can determine whether repairs or other actions are necessary to maintain the seawall in its approved state.

Therefore, Special Condition #4 requires the applicant to submit a monitoring report which evaluates the condition and performance of the seawall and overall site stability, and submit an annual report with recommendations, if any, for necessary maintenance, repair, changes or modifications to the project. In addition, the condition requires the applicant to perform the necessary repairs through the coastal development permit process.

Special Condition #8 requires that feasible alternative measures must be implemented on the applicant's blufftop property in the future, should additional stabilization be required, which would avoid additional alteration of the natural landform of the public beach or coastal bluffs, but would reduce risk to the principle residential structures and provide reasonable use of the property. The condition will ensure that future property owners will be aware that any future proposals for additional shoreline protection, such as upper bluff stabilization, will require an alternative analysis similar to one required for the subject project. If there are feasible alternatives to shoreline protection that would have less impact on visual quality, sand supply, or public access, the Commission (or, where applicable, the City of Encinitas and City of Solana Beach) will require implementation of those alternatives. The condition also states that no shore or bluff protection shall be permitted for ancillary improvements located within the blufftop setback area. Through this condition, the property owner is required to acknowledge the risks inherent in the subject property and that there are limits to the structural protective measures that may be permitted on the adjacent public property in order to protect the existing development in its current location.

Special Condition #1 requires the applicant to submit final plans for the project indicating that the seawall conforms to the bluff contours, details the design of the southern end of the wall and that demonstrate that any existing irrigation systems on the blufftop have been removed or capped, as these would impact the ability of the seawall to adequately stabilize the site. In addition, the condition requires that any existing accessory structures located within 5 ft. of the bluff edge shall be removed within 60 days of issuance of the permit. Submission of final plans will ensure that overall site conditions that could adversely impact the stability of the bluff have been addressed.

Special Condition #9 notifies the applicants that they are responsible for maintenance of the herein approved shore and bluff protection. The condition also indicates that, should it be determined that maintenance of the proposed structures are required in the future, including maintenance of the color and texture, the applicant shall contact the Commission to determine if permits are required.

To assure the proposed shore/bluff protection has been constructed properly, Special Condition #7 has been proposed. This condition requires that, within 60 days of completion of the project, as built-plans and certification by a registered civil engineer be submitted that verifies the proposed seawall and backfill have been constructed in accordance with the approved plans. The presence and location of the clean sands is a significant part of the need for and design of the proposed project. This lens may influence future plans for maintenance on this property and information on its location and extent may be important to future actions at this site and at adjacent locations. Since the clean sand lens will be covered by the proposed seawall, Special Condition #5 requires that the elevation of the clean sand lens and the contacts between this lens and both the terrace deposits and the Torrey Formation be included on the as-built plans.

Special Conditions #10 requires the applicant to submit a copy of any required permits from other local, state or federal agencies to ensure that no additional requirements are placed on the applicant that could require an amendment to this permit.

Also, due to the inherent risk of shoreline development, Special Condition #13 requires the applicant to waive liability and indemnify the Commission against damages that might result from the proposed shoreline devices or their construction. The risks of the proposed development include that the proposed shoreline devices will not protect against damage to the residences from bluff failure and erosion. In addition, the structures themselves may cause damage either to the applicant's property or to neighboring properties by increasing erosion of the bluffs. Such damage may also result from wave action that damages the seawall. Although the Commission has sought to minimize these risks, the risks cannot be eliminated entirely. Given that the applicants have chosen to construct the proposed shoreline devices despite these risks, the applicants must assume the risks. Special Condition #14 requires the applicant to record a deed restriction imposing the conditions of this permit as covenants, conditions and restrictions on the use and enjoyment of the property. Only as conditioned can the proposed project be found consistent with Sections 30235 and 30253 of the Coastal Act.

In summary, the applicant has documented that the existing blufftop primary structure is in danger from erosion and subsequent bluff collapse and that the proposed seawall is necessary to address that threat. As conditioned, there are no other less damaging alternatives available to reduce the risk from bluff erosion. Thus, the Commission is required to approve the proposed protection for the residential structure. Since the proposed seawall will contribute to erosion and geologic instability over time and also deplete sand supply, occupy public beach and fix the back of the beach, the applicants have proposed to pay an in-lieu mitigation fee to offset this impact. Therefore, as

conditioned, the Commission finds that the proposed seawall is consistent with Sections 30235 and 30253 of the Coastal Act.

3. Public Access/Recreation. As a result of the adverse impacts on local sand supply, shoreline protective devices also have significant adverse impacts to public access and recreation. Coastal Act Section 30604(c) requires that every coastal development permit issued for any development between the nearest public road and the sea "shall include a specific finding that the development is in conformity with the public access and public recreation policies of [Coastal Act] Chapter 3." The proposed project is located seaward of the first through public road, on the beach. Coastal Act Sections 30210 through 30213, as well as Sections 30220 and 30221 specifically protect public access and recreation, and state:

> **Section 30210:** 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:** 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(a):** Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects…
>
> **Section 30213:** Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. …
>
> **Section 30220:** Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.
>
> **Section 30221:** Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

Coastal Act Section 30240(b) also protects parks and recreation areas such as South Cardiff State Beach. Section 30240(b) states:

> **Section 30240(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.

The project site is located within South Cardiff State Beach, a beach that is utilized by local residents and visitors for a variety of recreational activities such as swimming, surfing, jogging, walking, surf fishing, beachcombing and sunbathing. South Cardiff State Beach has an approximately 412 space parking lot located approximately 400 feet north of the subject site which supports use of the approximately 2-3 mile long stretch of Cardiff State Beach. In addition, Table Top Reef which is made of ancient oyster beds that are upwards of 6 feet in elevation above the shore platform is located immediately northwest of the subject site. Table Top Reef is used extensively by the public, particularly at low tide for tide-pool activities. The proposed seawall will be constructed on sandy beach area that is currently available to the public and will have both immediate and long-term adverse impacts on public access and recreational opportunities.

Although the proposed seawall has been designed to be as narrow as feasible, it will project approximately 2.5 feet seaward of the toe of the bluff. In addition, although the seaward encroachment of the wall appears at first glance to be minimal, the beach along this area of the coast is narrow and at high tides and winter beach profiles, the public may be forced to walk virtually at the toe of the bluff or the area may be impassable. As such, an encroachment of any amount, including 2.5 feet for a length of 145 feet onto the sandy beach, reduces the small beach area available for public use and is therefore a significant adverse impact. This is particularly true given the existing beach profiles and relatively narrow beach. In addition, however, were it not for the seawall, the seaward face of the bluff would naturally recede making additional beach area available for public use. During the 22 year life of the seawall, as the beach area available to the public is reduced, dry sandy beach will become less available seaward of the seawall such that beachgoers will not want to sit or lay a towel in this area. In addition, over time as the surrounding unprotected bluffs recede, the seawall structure will likely impede or completely eliminate public access to the beach south of the subject site.

As explained in Section 2 of this report, the proposed seawall will result in the encroachment and the fixing of the back beach, which will result in the immediate loss of 362.5 square feet of beach and after 22 years, with no recession of the bluff, will result in the loss of a total approximately 1,638.5 square feet of public beach. The sand that would have reached the beach were it not for the proposed seawall is generally mitigated by the applicant’s proposal to pay an in-lieu for the purchase of an equal amount of sand for future placement. However, the loss of this approximately 1,638.5 sq. ft. of recreational area is not mitigated by the one-time placement of sand since that area will not be available for public use (or placement of sand) over the estimated 22 year life of the seawall. Since any loss of public beach area will significantly affect public access and recreational opportunities along the beach adjacent to South Cardiff State Beach, additional mitigation is required.

Development along the shoreline which may burden public access in several respects has been approved by the Commission. However, mitigation for any adverse impacts of the development on access and public resources is always required. The Commission's permit history reflects the experience that development can physically impede public access directly, through construction adjacent to the mean high tide line in areas of

narrow beaches, or through the placement or construction of protective devices seawalls, rip-rap, and revetments. Since physical impediments adversely impact public access and create private benefit for the property owners, the Commission has found in such cases (in permit findings of CDP #4-87-161 [Pierce Family Trust and Morgan], #6-87-371 [Van Buskirk], #5-87-576 [Miser and Cooper]) that a public benefit must arise through mitigation conditions in order that the development will be consistent with the access policies of the Coastal Act, as stated in Sections 30210, 30211, and 30212.

The most appropriate mitigation for the subject development would be the replacement of the 1,638.5 sq. ft. of beach with an identical area of beach in close proximity to the eliminated beach area. However, all of the beach areas in Encinitas and Solana Beach are already in public ownership such that there is not private beach area available for purchase. As discussed in more detail below, in addition to the more qualitative social benefits of beaches (recreational, aesthetic, habitat values, etc.), beaches provide significant direct and indirect revenues to local economies, the state, and the nation. There is little doubt that the loss of 1,638.5 sq. ft. of sandy beach in an urban area such as the Encinitas/Solana Beach shoreline represents a significant impact to public access and recreation, including a loss of the social-economic value of this recreational opportunity. In addition, not only will sandy beach area be lost, but access along the shoreline to the south will eventually be cut off as the beach area is lost in front of the seawall. Based on vehicle counts by the California Department of Park and Recreation Rangers and the attendance counts performed routinely by the lifeguards, during the high season (Memorial day through Labor Day) average monthly vehicle counts at South Cardiff State Beach are 4,412.5 vehicles per month and 53,602 people per month. The number of visitors to South Cardiff State Beach over the last year is estimated to be in excess of 271,900 (based on attendance counts for January through September. No attendance numbers were available for October through December. Attendance numbers are available via the City of Encinitas website http://www.cityofencinitas.org/ and are summarized in Table 1 on page 31 of this staff report. There are undoubtedly substantial benefits being provided to these users of the beach resource. The question becomes how to adequately mitigate for the impact of the loss of 1,638,5 sq. ft. of beach, and in particular, how to determine a reasonable value of this impact that could serve as a basis for mitigation, in light of the absence of actual feasible mitigation measures to maintain or create equivalent beach resources at or near the project site.

In the past ten to fifteen years, the Commission has approved the construction of shoreline devices in San Diego County when they are necessary to protect an existing primary structure and when mitigation is provided according to a formula that the Commission developed to address some of the more easily quantifiable effects on local sand supply, as required by Section 30235 of the Coastal Act. In each of those decisions, the Commission recognized that the mitigation in the form of an in-lieu fee paid for the purchase of sand to offset the sand lost by the shoreline structure, provided some, but not all mitigation, associated with the adverse impacts of shoreline devices. Recently the Commission has asked for additional ways to quantify the adverse impacts to public access and recreation that result from shoreline protective devices and, thereby, develop more appropriate mitigation for those impacts. One possible way to determine an

appropriate mitigation fee is to estimate the economic recreational value of the beach in front of a seawall, which will eventually be lost due to the construction of the seawall.

Recently, the Commission contracted with Dr. Phillip King, Chair of the Economics Department at San Francisco State University, to perform an economic analysis of the loss of recreational values associated with the Las Brisas seawall which is located adjacent to Fletcher Cove Beach Park, the City of Solana Beach's primary beach access point (Ref. Exhibit #5, the Las Brisas Economic Analysis). His report detailed his assessment of the value of a day at the beach fronting the Las Brisas seawall which is located approximately ½ mile south of the subject site. The report provided an estimate of the potential loss of value resulting from the Las Brisas seawall's construction and placement over 22 years:

> In order to estimate the loss of recreational benefits for this project one must know the recreational value of the beach before and after the project. The standard methodology here, used by all economists working for government agencies, is to estimate the day use value for each visitor (i.e., how much is a beach day worth) and multiply this by the number of visitors. To estimate the loss of recreational value one must estimate the decrease in day use value, as well as potential decrease in visitation. My report will begin with an estimate of visitation, then day use value before and after the project and then provide an estimate of the total loss. (Ref. p. 2, Exhibit 4)

As Dr. King described in his report, there are various accepted economic techniques and methodologies available to estimate recreation values: "The most common technique is the travel cost method and its more sophisticated offshoot, the random utility model (RUM). The other main technique used is the contingent valuation method." He explained that his approach is based on a RUM and involves the use of a "benefit transfer" comparison model, based on a comparison of the characteristics of the subject beach with other beaches whose recreational values have been assessed, to extrapolate from those "measured" beaches to other beaches across the State of California. He indicated that the methodology also incorporates a number of studies that analyze the effect of beach width on recreational value and attendance throughout Southern California. Because the RUM is an offshoot of the travel cost method, it is ultimately based on the amount of money people are willing to spend to reach the beach. Since there is every reason to think that at least some of the people visiting the beach would be willing to pay even more, if it would cost more, to reach the beach, this method inevitably yields a minimum value.

Generally, Dr. King's study compared the beach fronting Las Brisas Condominiums and Fletcher Cove with what he terms a beach with perfect amenities (for a Southern California beach). He assigned a day use value of $14.00 as the value of an individual's day at the perfect beach. This value was derived from the examination of various comparable studies, including what is likely the best known study, by a Dr. Hanemann (considered one of the foremost experts in the field) for the American Trader Case, which, adjusted for today's dollars, concluded that the value of a day at Huntington Beach was approximately $16.00 (The American Trader Oil Spill, unpublished Memo,

1998, by Chapman, Haneman and Rudd). (However, Dr. King emphasized that the $14.00 value may be very conservative since "many studies have derived values a high as $30.00 per day.") Using $14.00 as the value of a day at a perfect beach, Dr. King's methodology then used specific "amenity values" of a studied beach to assess how that beach compares to the model beach, and thus, what value should be assigned to represent the value of the studied beach. These "amenity" values addressed the parameters of weather, water quality/surf, beach width and quality, overcrowding, facilities and services, and availability of substitute beaches.[2] Perfect weather, for example would involve a beach where every day is warm and sunny. Perfect beach width and quality, for example, is described as having from 100 to 250 ft. of fine, white sandy beach width. In addition, each amenity is weighted so that, for instance, weather makes up 20% of the final value, while beach width and quality make up only 15%.

In the case of the Las Brisas seawall, Dr. King determined that the beach fronting Fletcher Cove and Las Brisas is not a "perfect" beach. By carefully assigning site-specific amenity values, Dr. King estimated that the beach fronting Fletcher Cove and Las Brisas has a total amenity value of 48.7% of a perfect beach. Since his conservative estimate of a "perfect" beach is valued at $14.00, the beach at Las Brisas was estimated to have a value of $6.81 per day (48.7% of a perfect beach value). To estimate the overall economic recreational value of a beach he then multiplied the day use value ($6.81) by the total number of visitors.

For Fletcher Cove, Dr. King identified that Solana Beach does not record beach attendance and that his estimates on use are derived from discussion with City lifeguards and use of a recent parking study conducted for the City of Solana Beach at Fletcher Cove. Based on that information, he estimated that approximately 92,460 individuals visit the beach fronting the Las Brisas site each year (approximately 40,460 during the 3 summer months and approximately 52,000 over the remaining year). However, he emphasizes that because of concerns he has with the parking study, the amount of non-summer use may be a "very rough" and conservative estimate. Finally, once the recreational value of the beach fronting the Fletcher Cove and Las Brisas had been derived, the loss of value resulting from the placement of the subject seawall had to be determined. It is this loss of recreational value resulting from a seawall that must be mitigated.

In calculating the loss of recreational value, Dr. King estimated the amount of beach that will be lost by the placement of the Las Brisas seawall initially and over 22 years. He identified that 652 sq. ft. will be lost immediately after the seawall is constructed and 32.4 sq. ft. per year for the next 22 years. Using that information he adjusted the amenity values for beach width and overcrowding (the two factors affected by the loss of beach) for each of the 22 years (and adjusts population figures as well, to account for projected population change). As a result of these adjustment of the amenity factors (the other

[2] This approach does not factor in loss of aesthetic value to those who continue to attend and does not take into account the loss of lateral access to the beach area south of the proposed seawall after the beach is gone. Therefore, this approach results in a conservative estimate of the recreational loss.

amenity factors, weather, surf, etc. remaining constant) along with the application of "real discount rate", Dr. King estimated that the reduction of recreational value over 22 years resulting from the placement of the seawall equates to approximately $248,680.72.

In the case of the Las Brisas seawall , the Commission found that for the various reasons listed above, the fee generated is likely to be an underestimate of the total loss of recreational value as a result of the seawall's impacts on shoreline sand supply. The Commission found that the applicant was required to mitigate for the significant loss of recreational value resulting from the proposed seawall. In that case, the mitigation involved the payment of a $248,680.72 fee which could be used in a variety of ways such as purchase of beach land, recreational and beach park amenities, or for sand replenishment.

The proposed 145 ft.-long seawall will have very similar impacts to public access and recreational opportunities to the Las Brisas seawall and the analysis of recreational losses due to the proposed 145 foot long seawall relies strongly on the methodology developed by Dr. King for the Las Brisas seawall. The modifications to the "Las Brisas" economic analysis are as follows:

Extent of Beach
The overall recreational beach area that will be affected by the proposed seawall is the 900 foot long section defined, using the shoreline Divisions developed in the Solana Beach Master EIR for Shoreline and Coastal Bluff Management Strategies, as Reach 1 (from South Cardiff State Beach south past Table Top Reef, and half of Reach 2 (from south of Table Top Reef to about 200 north of the northern end of Tide Park).

Beach Width
The overall average width of the high season recreational beach area that will be effected by the proposed seawall is 60 feet, as modified from the mean high tide beach width developed from six years of shoreline surveys undertaken by SANDAG and 30 feet wide at the proposed wall location, as measured from the provided site plans.

Beach Use (Overcrowding)
Beach attendance is taken from the vehicle and attendance counts from the City of Encinitas website (compiled into Table 1 on Page 31 of this staff report)

Value of Day at Beach
The beach value is adjusted to reflect the $8 day-use-value developed by Dr. King for Encinitas beaches (verbal communication from Kathy Weldon, City of Encinitas)

Rating of amenity values (weather, water quality/surf, facilities and services, availability of substitutes), growth in numbers of beach users and discount factors were kept unchanged from the information developed for the Las Brisas project.

Based on the above noted modifications to the Las Brisas analysis, the proposed seawall would have a recreational impact of $198,133.74 in present value, based on 22 years of impacts.

PV High Season Loss	$165,109.78
PV Low Season Loss	$33,021.96
Total	$198,131.74

Since the Commission and the San Diego Association of Government already have an established beach sand replenishment fund, the Commission is recommending that the monies could be used for the purchase of beach sand that ultimately will be placed along the San Diego coastline, but also, these funds could be used to construct public access and recreational improvements. Therefore, Special Condition #2 requires the applicant to contribute an in-lieu fee in the amount of $198,131.74 to the SANDAG fund as mitigation for the impacts of the seawall on public access and recreation opportunities. In addition, as identified in Section 2 of the subject report, the seawall will result in sand no longer reaching the beach over the next 22 years from the bluff area behind the seawall. As identified in Section 2, the applicant is also required to mitigate this loss of sand by the payment of an in-lieu of $21,420.00 paid into the SANDAG beach replenishment fund. Therefore, in total, the applicant is required to pay $219,551.74 to mitigate for the adverse impacts to sand supply, public access and recreation.

This stretch of beach has historically been used by the public for access and recreation purposes. Special Condition #12 acknowledges that the issuance of this permit does not waive the public rights that may exist on the property. The seawall may be located on State Lands property as well as on State Parks land, and as such, Special Condition #11 requires the applicant to obtain any necessary permits or permission from the State Lands Commission and the California Department of State Parks and Recreation to perform the work.

In addition, the use of the beach or public parking areas for staging of construction materials and equipment can also impact the public's ability to gain access to the beach. While the applicant has not submitted a construction staging and material storage plan for the subject development, it is likely that beach access to the site will occur via the South Cardiff State Beach parking lot which is located approximately 200 feet north of the subject site. Because the applicant has not identified the location of the staging and storage area, Special Condition #6 has been attached to mitigate the impact on public parking areas and public access. Special Condition #6 prohibits the applicant from storing vehicles on the beach overnight and prohibits washing or cleaning construction equipment on the beach or in the parking lot. The condition also prohibits construction on the beach during weekends and holidays and between Memorial Day to Labor Day of any year.

With Special Conditions requiring mitigation for the loss of recreational value resulting from the shoreline protective device, assuring maximum public access during construction, and authorization from the State Lands Commission, impacts to the public will be minimized to the greatest extent feasible. Thus, as conditioned, the Commission finds the project consistent with the public access and recreation policies of the Coastal Act.

4. Visual Resources/Alteration of Natural Landforms. Section 30240 (b) of the Coastal Act is applicable and states:

> (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.

In addition, 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 . . .

As stated above, the proposed development will occur on the public beach. An approximately 160 ft.-long seawall has been constructed approximately adjacent to the north side of the subject site (ref. CDP Nos. 6-87-581/Steinberg). However, the bluffs to the south side of the subject site remain in their natural state. With a proposed 145 ft.-long, approximately 22 ft.-high seawall structure, the potential for adverse impacts on visual resources of the adjacent natural bluffs resulting from the proposed development could be significant.

To mitigate the visual impacts of the proposed seawall and backfill, the applicant proposes to color and texture the seawall and backfill. The visual treatment proposed is similar to the visual treatment approved by the Commission in recent years for seawalls along the Solana Beach shoreline. (ref. CDP #6-02-84/Scism; 6-02-02/Gregg, Santina; 6-03-33/Surfsong; 6-04-83/Cumming, Johnson).

To assure the adequacy of the visual treatment, Special Condition #1 requires the submittal of detailed plans, color samples, and information on construction methods and technology for the surface treatment of the structures. In addition, to address other future adverse visual impacts, Special Conditions Nos. 4 and 9 have been attached which require the applicant to monitor and maintain the proposed seawall in its approved state. In this way, the Commission can be assured that the proposed seawall will be maintained so as to effectively mitigate its visual prominence.

Therefore, as conditioned, the Commission finds that potential visual impacts associated with the proposed development have been reduced to the maximum extent feasible and the proposed development will include measures to prevent impacts that would significantly degrade the adjacent park and recreation area (beach area). Thus, the project as conditioned can be found consistent with Sections 30240 and 30251 of the Coastal Act.

5. Local Coastal Planning. The subject site is located on the beach within the City of Encinitas. In November of 1994, the Commission approved, with suggested modifications, the City of Encinitas Local Coastal Program (LCP). Subsequently, on May 15, 1995, coastal development permit authority was transferred to the City. Although the site is within the City of Encinitas, it is within the Commission's area of original jurisdiction. As such, the standard of review is Chapter 3 policies of the Coastal Act, with the City's LCP used as guidance.

In the case of the proposed project, site-specific geotechnical evidence has been submitted indicating that the existing structures at the top of the bluff are in danger. The Commission feels strongly that approval of the proposed project should not send a signal that there is no need to address a range of alternatives to armoring for existing development. Planning for comprehensive protective measures should include a combination of approaches including limits on future bluff development, ground and surface water controls, and beach replenishment. Although the erosion potential on the subject site is such that action must be taken promptly, decisions regarding future shoreline protection should be done through a comprehensive planning effort that analyzes the impact of such a decision on the entire shoreline both in the City of Encinitas as well as in neighboring Solana Beach.

Based on specific policy and ordinance language requirements placed in the LCP by the Commission, the City of Encinitas is in the process of developing a comprehensive program addressing the shoreline erosion problem in the City. The intent of the plan is to look at the shoreline issues facing the City and to establish goals, policies, standards and strategies to comprehensively address the identified issues. To date, the City has conducted several public workshops and meetings on the comprehensive plan to identify issues and present draft plans for comment. However, at this time it is uncertain when the plan will come before the Commission as an LCP amendment or when it will be scheduled for local review by the Encinitas City Council.

Based on the above findings, the proposed seawall development as conditioned is consistent with the Chapter 3 policies of the Coastal Act in that the need for the seawall has been documented, its adverse impacts on public access and recreational use, beach sand supply and visual resources will each be mitigated. Therefore, the Commission finds that approval of the proposed seawall development, as conditioned, will not prejudice the ability of the City of Encinitas to prepare a comprehensive plan addressing the City's coastline as required in the certified LCP and consistent with Chapter 3 policies of the Coastal Act.

6. Consistency with the California Environmental Quality Act (CEQA).
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 proposed project has been conditioned in order to be found consistent with the water quality, geologic stability, visual quality, and public access and recreation policies of the Coastal Act. Mitigation measures, including conditions addressing payment of an in-lieu fee for impacts to sand supply, a fee to mitigate for the loss of public access and recreation opportunities, monitoring and maintenance of the structures over the lifetime of the project, color of construction materials, timing of construction and the use of BMP's will minimize all adverse environmental impacts. As conditioned, there are no feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment. Therefore, the Commission finds that the proposed project is the least environmentally-damaging feasible alternative and is consistent with the requirements of the Coastal Act to conform to CEQA.

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 or 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.

Table 1

Vehicle Counts and Attendance Estimates for South Cardiff State Beach, provided by City of Encinitas and California State Park Rangers

Month	Year	Vehicles/month	Vehicles/day	Attendance/month	Attendance/day
January	2006	2130	68.7		295
February	2005			4,923	175.8
February 2006	2006	1,740	62.1		
March	2005			8950	288.7
March	2006	2,010	64.8		
April	2005			12,459	415.3
April	2006	1,770	59	24,423	814.1
May	2006	3,840	123.9	21,444	691.7
May	2005			22,931	739.7
June	2006	3,950	131.6	22,009	733.6
June	2005			26,657	888.57
June Average	2006	3,950	131.6	24,333	811.1
July	2005	4,100	132.2	85,842	2,769.1
August	2006				
August	2005	5,400	174.2	81,642	2,633.6
September	2005	4,200	140	22,590	753
October	2005	3,250	104.8		
November	2005	2,100	70		
December	2005	1,820	58.7		
High-Season Ave. (June through September)		4,412.5	144.6	53,601.8	1,757.4

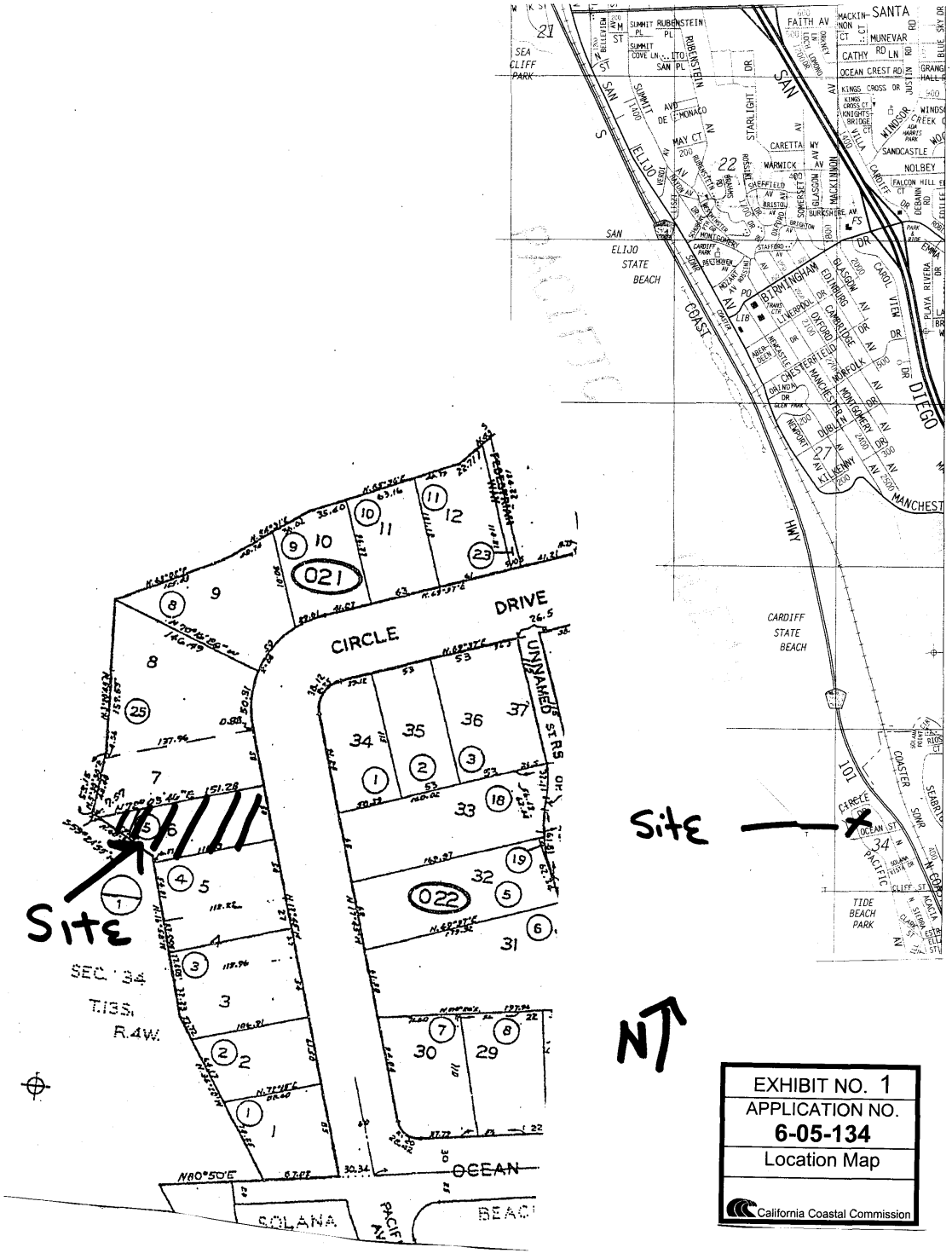


EXHIBIT NO. 1
APPLICATION NO.
6-05-134
Location Map
California Coastal Commission

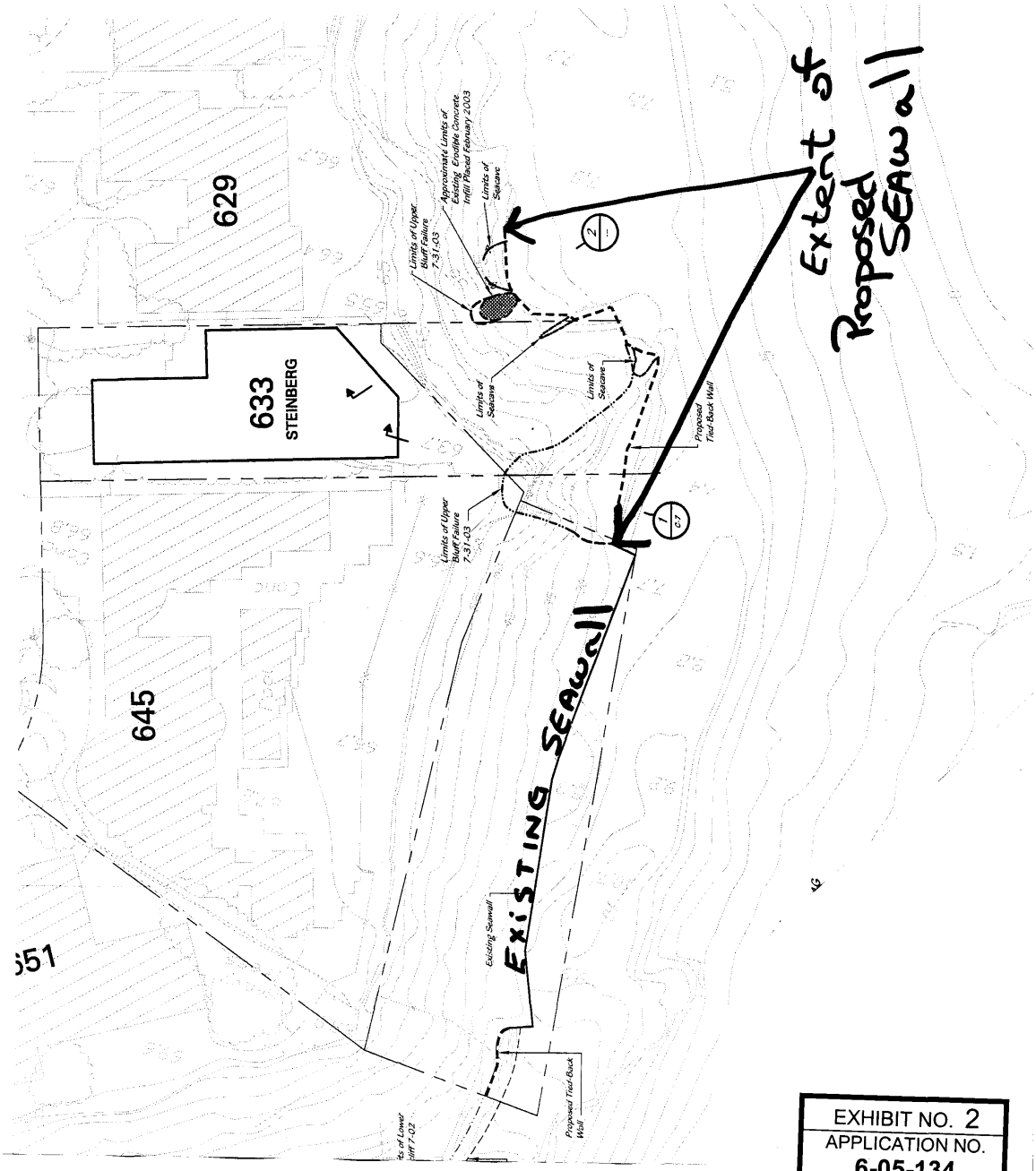
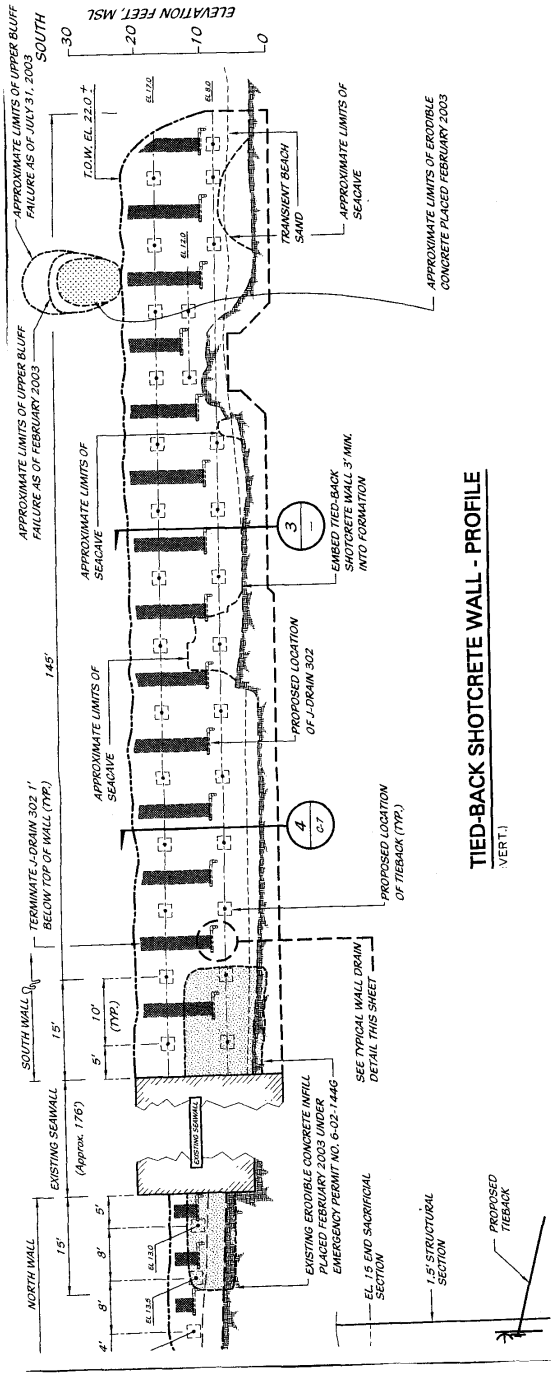


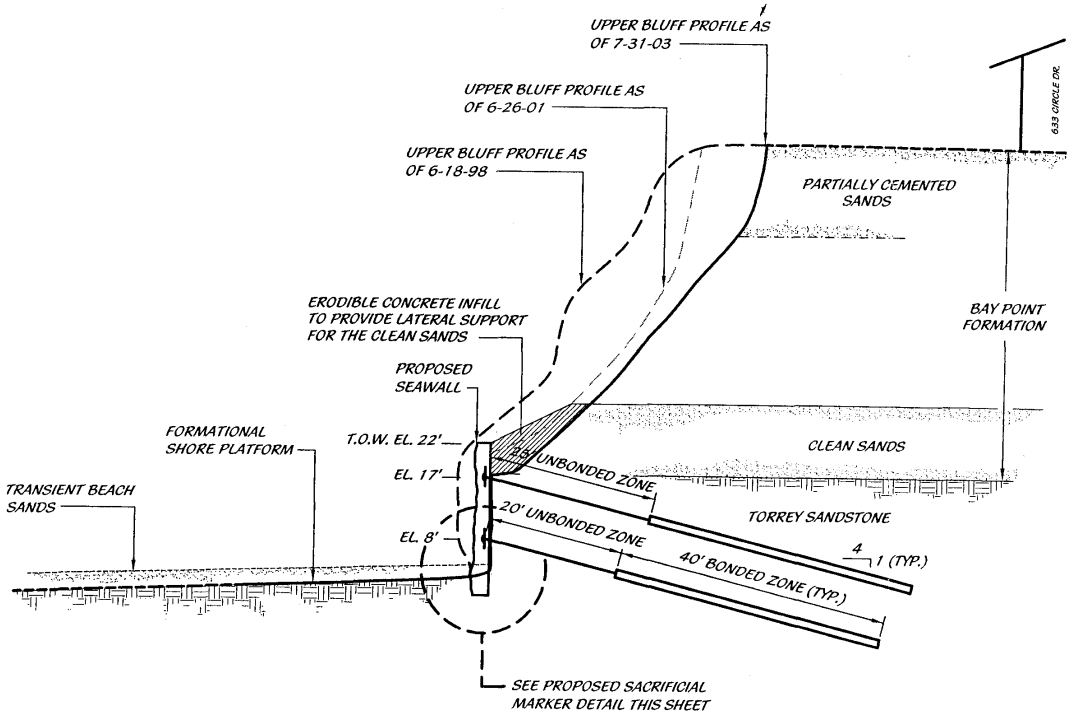
EXHIBIT NO. 2
APPLICATION NO.
6-05-134
Site Plan
California Coastal Commission



TIED-BACK SHOTCRETE WALL - PROFILE

(VERT.)

EXHIBIT NO. 3
APPLICATION NO.
6-05-134
Seawall Profile
California Coastal Commission



PROPOSED TIED-BACK WALL SECTION 1

SCALE: 1"=10' (HORIZ.:VERT.)

EXHIBIT NO. 4
APPLICATION NO.
6-05-134
Seawall Section
California Coastal Commission

An Analysis of the Loss of Recreational Benefits due to Construction of the Las Brisas Seawall in Solana Beach

Dr. Philip G. King

Chair, Economics Dept.

San Francisco State University

October 2, 2005

I have been asked by the California Coastal Commission to provide an analysis of the loss in recreational value due to the creation of a 120 ft seawall at Las Brisas, just south of Fletcher Cove in Solana Beach. The project time period is 22 years. My analysis is based upon the following evidence:

- Three site visits on the weekend of June 18-19, 2005 including observations of the beach at high and low tide.
- Several site visits during the week of July 16-23, 2005 and a visit on August 28, 2005.
- A survey and analysis conducted for the City of Solana Beach in 2001 entitled "Economic Analysis of Beach Spending and the Recreational Benefits of Beaches in the City of Solana Beach"
- Numerous other site visits to Solana Beach over the past 6 years
- Conversations (mostly in 2001, but also in 2005) with Solana Beach lifeguard staff
- Fletcher Cove Parking Study prepared for the City of Solana Beach by Katz, Okitsu, and Associates, April 12, 2005.
- A Staff Report prepared by the California Coastal Commission regarding the Las Brisas Seawall and data from the Commission regarding the predicted impact of the Seawall on the current beach area
- Numerous photos provided by the Coastal Commission and from the California Coastal Records Project website: www.californiacoastline.org
- Other reports and surveys prepared for the State of California, the US Army Corps of Engineers and local communities regarding the economics of beach recreation (see references).

In order to estimate the loss of recreational benefits from this project one must know the recreational value of the beach before and after the project. The standard methodology here, used by all economists working for government agencies, is to estimate the day use value for each visitor (i.e., how much is a beach day worth) and multiply this by the number of visitors. To estimate the loss of recreational value one must estimate the decrease in day use value, as well as potential decrease in visitation. My report will begin with an estimate of visitation, then day use value before and after the project and then provide an estimate of the total loss.

1. Attendance

Solana Beach does not record attendance for its beaches. For the purposes of this project I consider the beach area at Fletcher Cove and the adjacent Las Brisas beach as contiguous. In several visits to the area I have noted that visitors spread out continuously over this area. Most access the beach through the concrete ramp at Fletcher Cove. My 2001 survey indicated that approximately 3/4 of visitors to Solana Beach were on day trips. Approximately 1/3 were local residents and 1/3 were from San Diego County; the remaining third came from California and

other states with few foreign visitors. 60% of visitors in the survey reported they arrive on the beach that day by car; 40% arrived by other means, mostly by foot.

My estimate of high season attendance is based on numerous site visits, discussions with lifeguards, as well as a study of parking at Fletcher Cove, performed by Katz, Okitsu, and Associates.[1] Katz, Okitsu, and Associates estimate parking in February and then applied a rule of thumb to estimate high season parking. Their method probably *underestimates* parking[2], however this analysis will use their data since no other data is available. Table 1 below presents various parking-related estimates for people arriving to Fletcher Cove/Las Brisas by car on a typical summer day.

Table 1: Estimate of Parking and Turnover fromKatz, Okitsu and Associates

Item	M-F	Weekend	Week
Avg. Parking Occupancy 7am-6pm	21%	26%	23%
Avg. Time per vehicle	1.71	1.54	1.66
Parking Study Turnover in 12 hour period	7.0	7.8	7.2
My est. of turnover	6.0	6.0	6.0
Total Capacity of Fletcher Cove Lot	62	62	62
Avg Number of Cars (at a given time)	13.3	16.2	14.1
Est. Total # Cars per day	79.7	97.0	84.6

Table 2 presents my estimate of high season (Memorial Day weekend to Labor Day weekend) attendance: 40,460. My own observations in several site visits in 2001 and in June, July and August of 2005 indicate that forty thousand is a good estimate. Based on data from my 2001 survey, I assume 3.2 people per car. My 2001 survey also indicated that 40% of beach attendees did not come by car (usually they walked). Table 2 accounts for this attendance as well. My observations indicate that the vast majority of people who park in the Fletcher Cove lot during high season use the beach.

Table 2: Estimate of High Season Attendance

Item	Estimate
# Cars/day	85
Est % Cars beach related	90%
# People per Car	3.2
# Visitors by Car	244
# Visitors by Other Means	161
Total Visitors per Day	405
# Days in High Season	100
Total Visitors High Season	40,460

[1] See Memo to Chandra Collure, City of Solana Beach, April 12, 2005, Subject Fletcher Cove Parking Study, by Katz, Okitsu, and Associates.
[2] They multiply low season parking by a factor based on shopping and other beach attendance, but without accounting for the specific traffic at Fletcher Cove, their analysis is insufficient.

Katz, Okitsu, and Associates data was actually collected in February and adjusted upwards for high season. Their methodology assumes that 22% fewer people go on an average day in February than in the summer. Applying their rule, I estimate that off-season attendance is 52,000, however this is a rough approximation and I have much less confidence in this estimate. In particular, there are no data on how many people arrive at the beach by car and how many walk or use other means.

My final analysis also adjusts attendance for increases in population. The City of Solana Beach is near build-out and over the next 15 years, the City is expected to have a much lower growth rate than the State as a whole. I obtained projections for future population increases in Solana Beach and the surrounding region from a study prepared for UCSD.[3] Based on this research as well as my survey results I have applied an increase of 0.5% per year, for future beach attendance at this location.

2. Day Use Value Methodology

Economists have developed a number of techniques to value recreation for "non-market" goods such as a day at the beach. Non-market goods are those which have no price attached, such as Fletcher Cove/Las Brisas. However a day at the beach has obvious value for visitors. Economists have created several techniques to estimate these values. The most common technique is the travel cost method and its more sophisticated offshoot, the random utility model (RUM). The other main technique used is the contingent valuation method.

The standard practice for estimating recreational value is to estimate the day-use value—how much is one beach day worth for one person. Numerous studies of day use value have been conducted in the State of California. Perhaps the best know study, by Hanemann, was created for the American Trader Case.[4] Adjusted for today's dollars, Hanemann estimated that a day at Huntington Beach was worth $16 per person.

The most sophisticated study of beach use in California was conducted by Dr. Michael Hanemann (UC Berkeley), Dr. Linwood Pendleton and others. Both are recognized experts in the field and Dr. Hanemann is widely considered to be one of the leading experts in the world on this topic. They used a RUM to estimate the value of a beach day at a number of southern California Beach towns. Unlike previous studies (such as Huntington Beach) they account for substitution—the fact that if one beach disappears visitors can go to others, which was a weakness in earlier estimates. Since these RUM models do not consider congestion at beaches, and focus primarily on visitors from southern California, their estimates are likely a lower bound for beach values. For more information on their project, see http://marineeconomics.noaa.gov/SCbeaches/welcome.html.

For beaches where no study has been conducted it is possible to use a technique referred to as "benefits transfer" (BT). In BT, one equates a beach not studied with a similar beach. This technique is widely used by Federal government agencies to assess the value of recreational sites for public policy.

[3] UCSD Long Range Development EIR, prepared by Keyser Martson Associates, Inc, April 2004.
[4] Chapman, D., Hanemann, M., and Ruud, P. 1998. The American Trader Oil Spill, unpublished Memo.

I recently developed a benefits transfer protocol for the State of California which has now been applied by the State to a number of beaches in the State for use in Public Policy work.[5] This methodology allows one to estimate day use values for beaches across the State based on the quality of the recreation experience. This methodology is consistent with economic theory and with results from the Southern California Beach project. This methodology also incorporates a number of studies that analyze the effect of beach width on recreational value and attendance throughout Southern California. A more complete discussion of this methodology is in King (forthcoming, see references). Table 3 presents the key criteria in this methodology. The highest possible score is $14 per day. I derived this valued after examining numerous studies, in particular after interviewing people involved with the Southern California Beach project. The model was calibrated for Huntington beach, which yields a value of just over $10 a day, consistent with the most recent work in the state by the southern California Beach Project. This $14 value is conservative number since many studies have derived values as high as $30 per day.

Table 3: A Rating System for Benefits Transfer

Amenity	Relative Weighting
Weather	20%
Water Quality/Surf	20%
Beach Width and Quality	15%
Overcrowding	15%
Facilities and Services	15%
Availability of Substitutes	15%

- **Weather**: Points are assigned according to the number of warm sunny days. A perfect score of 100 (per cent) would indicate that every day is warm and sunny. High winds are a negative factor. A score of 90-100 indicates almost perfect weather. Since virtually all southern California beaches have morning fog it is unlikely any California beach would score in the 90s. Some beaches where sunshine is predominate after 10 or 11 am (e.g., Huntington) should score in the 80s. Beaches with generally poor weather (e.g., Oxnard) would score below 50%.
- **Water Quality/Surf**: Some beaches in southern California (e.g., Huntington) are closed periodically due to poor water quality. A perfect score for water quality indicates that there are no water quality issues and no closures. Some beaches (e.g. Carpinteria) come close. Surf is a more difficult category since surfers and swimmers sometimes have diametrically opposed preferences.
- **Beach Width and Quality**: The ideal beach width is approximately 100-250 ft. (e.g. Huntington). Narrower beaches are scored lower in direct proportion to width. Few

[5] The Economics of Regional Sediment Management in Ventura and Santa Barbara Counties: A Pilot Study, prepared for the California Department of Boating and Waterways, 2005, Forthcoming.

beaches in California are too wide but it is possible that a beach could be so wide that access is restricted. The quality of the beach depends on the quality of the sand—a fine white sandy beach is ideal and a beach with cobble is much less desirable. As a general rule, most recreational beaches we will be examining have good quality sand, though the proportion of cobble varies.

- **Overcrowding**: The USACE often follows a policy that 100 square feet of space is necessary per person. In practice this variable is difficult to measure without a precise study, however most people know overcrowding when they see or experience it. The value here also must be a composite of weekday and weekend values and, of course crowding depends on beach width and availability of parking. A score of 100 would indicate a beach where crowding is not an issue. (It does not mean no crowds and, of course, some beach visitors like crowds up to a point.) A low score is indicative of a beach where crowds significantly degrade the experience.
- **Other Recreational Amenities**: This category is primarily concerned with manmade recreational amenities. Restrooms, some snack facilities and other retail, and lifeguards services all generally add to the level of amenities. A beach with a score of 90-100 would have all the man-made amenities associated with a good quality beach (lifeguards, snack bars, close availability of retail and rental).
- **Availability of Substitutes**: A beach would score high (90 – 100) if there are **few** substitutes available nearby. If a beach has a particular set of attributes that are hard to find elsewhere, then it would score high as well. If substitutes are available but already crowded, one must also take this factor into account. As a practical matter, in southern California there are a wide array of beaches available nearby, but most are crowded on weekends. High quality beaches which are not particularly close to other similar quality beaches (Carpinteria, San Clemente) should score higher.

The various amenity values need to be combined to estimate a Beach Day Value. A standard functional form used by economists is the Cobb-Douglas function:

(4) Value of a Beach Day = $A_1^a * A_2^b * A_3^c * A_4^d * A_5^e * A_6^f$

where: $a + b + c + d + e + f = 1$

In the equation above, each of the terms, A_i , represents the index (in percentages from 0 to 100) from Table 2 above. The superscripts **a** through **f** represent the relative weightings of each terms (see Table 2 for weightings).

3. Application of Day Use Value Methodology to Fletcher Cove/Las Brisas

Table 4 applies the amenity value methodology developed above to Fletcher Cove/Las Brisas before a seawall is constructed—under current conditions. The amenity point value rating is based on site visits in June 2005, previous site visits and interviews with City officials, the California Coastal Access guide, and several photos taken in 2005. Fletcher/Las Brisas scores well on weather (as do most beaches in the area) and water quality, but much lower on recreational amenities, availability of substitutes and lowest on beach width and quality, since

the beach is already quite narrow. Column four below, "Weighted Amenity Value," is calculated by raising the amenity point value to the power of the weight. For example, for weather, the amenity point value, 0.85, is raised to the power of the weight: $0.85^{0.2}$, or 0.968. Economic theory posits that these weighted point values are multiplicative rather than additive. The final (multiplied) amenity value, 0.487, is multiplied by $14 to obtain the estimate for the current day use value in High Season of $6.81.

Table 4: Day Use value for Fletcher/Las Brisas before Seawall

Amenity	Amenity Point Value	Weight	Weighted Amenity Value
Weather	85%	20.00%	96.8%
Water Quality	75%	20.00%	94.4%
Beach Width and Quality	20%	15.00%	78.6%
Overcrowding	50%	15.00%	90.1%
Other Recreational Amenities	50%	15.00%	90.1%
Availability of Substitutes	30%	15.00%	83.5%
Total Index Value		100%	48.7%
Maximum Value per day	$ 14.00		
Fletcher/Las Brisas Value	$ 6.81		

4. Reduction in Day Use Value

Reducing the size of the beach will reduce the day use value in two ways. First, a narrower beach provides a less enjoyable beach experience.[6] I used the results from this survey and others to calibrate the benefits transfer model presented in the previous section. As second way that reduced beach size decreases the value of a beach day is through increased crowding. Should crowding become sufficiently high, people will go to another beach, which also implies a loss, since the beach they go to is their second choice. However, the relatively small amount of increased crowding from this project is unlikely to induce people to leave, but it reduces recreational value for visitors. For this analysis, I am assuming visitation will be unaffected by the seawall, but recreational value per visitor will fall slightly.

Table 5 below presents my estimate of the area of the beach. I measured the beach at high and low tide on June 18 and 19, 2005 and used an average of beach width for high and low tide. From these measurements, the estimated total usable beach area currently is 5640 square feet—very small.

[6] Overcrowding and the Demand for Beaches in Southern California, Dr. Philip G. King, April 2001.

Table 5: Area of Fletcher Cove/Las Brisas Beach

Dimension	Fletcher Cove	Las Brisas	Total
Length (ft)	150	120	
Low Tide Width (ft.)	4	0	
High Tide Width	60	14	
Avg. Width	32	7	
Area	4800	840	5640

The Staff Report and Preliminary Recommendation to the Coastal Commission indicate that 652 square feet will be lost immediately after seawall construction and 32.4 square feet per year after that until year 5, where the beach at Las Brisas disappears. Table 6 presents the estimate of the remaining beach, as a percentage of the original beach (100%).

Table 6: Reduction in Beach Width due to Seawall at Fletcher Cove/Las Brisas Beach

Year	Beach Area	% of Original
0	4988	88.4%
1	4956	87.9%
2	4923	87.3%
3	4891	86.7%
4	4858	86.1%
5	4826	85.6%
6	4826	85.6%
7	4826	85.6%
8	4826	85.6%
9	4826	85.6%
10	4826	85.6%
11	4826	85.6%
12	4826	85.6%
13	4826	85.6%
14	4826	85.6%
15	4826	85.6%
16	4826	85.6%
17	4826	85.6%
18	4826	85.6%
19	4826	85.6%
20	4826	85.6%
21	4826	85.6%

Finally, I apply the day use valuation model. The parameters for crowding and beach width are reduced in proportion to the loss in beach width. Since crowding and beach width are only 2 parameters, and since the valuation model is not linear, the loss in recreational value is much smaller, in percentage terms, than the loss of beach. To give an example, in the final year of the project, 14% of beach area is lost; however this translates into a total monetary loss of 31 cents ($6.81 minus $6.50), just under five percent of the day use value. Although the losses per visitor

are quite small, a few pennies per visitor per day, the overall loss is quite substantial, since in 22 years, hundreds of thousands of visitors are affected.

All of my calculations are in real 2005 dollars. Consequently I have applied a real discount rate of 3%.[7] The attendance numbers assume a modest (0.5%) increase in attendance based on projected population increases in Solana Beach and the surrounding area. Table 7 presents these results. For the 22 year period I estimate a (discounted) loss equal to $207,234.

Table 7: Reduction in High Season Recreational Value at Fletcher Cove/Las Brisas Beach

Year	Corrected Attendance	Day Use Value	Loss in Day Use Value	Total Recreational Loss	Present Value of Loss
0	40460	$ 6.57	$ 0.25	$ 9,976.48	$ 9,976.48
1	40662	$ 6.56	$ 0.26	$ 10,547.98	$ 10,231.54
2	40866	$ 6.54	$ 0.27	$ 11,127.35	$ 10,469.73
3	41070	$ 6.53	$ 0.29	$ 11,714.70	$ 10,691.69
4	41275	$ 6.52	$ 0.30	$ 12,310.12	$ 10,898.06
5	41482	$ 6.50	$ 0.31	$ 12,913.73	$ 11,089.46
6	41689	$ 6.50	$ 0.31	$ 12,978.30	$ 10,810.56
7	41897	$ 6.50	$ 0.31	$ 13,043.19	$ 10,538.67
8	42107	$ 6.50	$ 0.31	$ 13,108.41	$ 10,273.63
9	42317	$ 6.50	$ 0.31	$ 13,173.95	$ 10,015.24
10	42529	$ 6.50	$ 0.31	$ 13,239.82	$ 9,763.36
11	42742	$ 6.50	$ 0.31	$ 13,306.02	$ 9,517.81
12	42955	$ 6.50	$ 0.31	$ 13,372.55	$ 9,278.44
13	43170	$ 6.50	$ 0.31	$ 13,439.41	$ 9,045.09
14	43386	$ 6.50	$ 0.31	$ 13,506.61	$ 8,817.60
15	43603	$ 6.50	$ 0.31	$ 13,574.14	$ 8,595.84
16	43821	$ 6.50	$ 0.31	$ 13,642.01	$ 8,379.65
17	44040	$ 6.50	$ 0.31	$ 13,710.22	$ 8,168.91
18	44260	$ 6.50	$ 0.31	$ 13,778.77	$ 7,963.46
19	44482	$ 6.50	$ 0.31	$ 13,847.67	$ 7,763.18
20	44704	$ 6.50	$ 0.31	$ 13,916.90	$ 7,567.93
21	44927	$ 6.50	$ 0.31	$ 13,986.49	$ 7,377.60
Total					$ 207,233.94

5. Low Season Losses

Estimating Low Season loss is more difficult since we have less data. Section one presented an estimate of 52,000 for low season attendance based on the parking report by Katz, Okitsu, and Associates—roughly double the high season attendance. However, this estimate may not be reliable. The recreational value in low season is one half to one third of the recreational value in high season. Further low season visitors are less likely to care about beach width and the data

[7] Currently (September, 2005) the rate on 20 year Treasury Inflation Protected Securities is 1.76%. This is the best indicator of a real (inflation adjusted) interest rate for 20 years. We have added 1.25% since local borrowers will have a higher cost of borrowing.

provided by the Coastal Commission indicates that the dry beach area is narrower. Given the uncertainty here, we can only provide a rough estimate of low season loss. I estimate that the low season loss will be between 15% and 25% of the high season loss. 20% is a reasonable approximation where 20% of the high season loss is $41,447.

6. Total Loss

Table 8 presents of estimate of total loss in recreational value: $248,680.72.

Table 8: Total Recreational Loss due to the Las Brisas Seawall

PV High Season Loss	$	207,233.94
PV Low Season Loss		$41,446.79
Total	$	248,680.72

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Dr. Philip King received his Ph.D. from Cornell in 1987 specializing in Applied Microeconomics. He has taught Economics at San Francisco State University since 1987 and is currently chair of the Economics Department. He has been an active consultant with the State of California's Resource Agency since 1995 and has been the Principal Investigator on over two dozen projects for public and private agencies and traveled throughout the State to conduct informational interviews and present his findings to State and local officials. His projects include: evaluating the economic and fiscal impacts of California's beach tourism; examining the economic impacts of each one of California's Ports and Harbors on local industry clusters, and examining the fiscal impacts of beach tourism at both the State and local level; and using demographic data from the State of California to forecast the effect of future beach tourism on local communities in Southern California. He has completed over a dozen surveys (telephone, mail, on-site) for the State analyzing quantitative and qualitative data from survey data, private, and public secondary sources and informational interviews.