Final Master Environmental Impact Report

Solana Beach Shoreline and Coastal Bluff Management Strategies

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Submitted to:

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Solana Beach, California

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Project No. 323530000

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ABBREVIATIONS AND ACRONYMS

CCC	California Coastal Commission
CCEZM	Committee on Coastal Erosion Zone Management
CDMG	California Division of Mines and Geology
CDP	coastal development permit
CEQA	California Environmental Quality Act
CGIL	Coastal Geology and Imaging Laboratory
CSMW	Coastal Sediment Management Workshop
EA	Environmental Assessment
EIR	Environmental Impact Report
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
GIS	geographic information system
IFD	Infrastructure Financing District
LCP	Local Coastal Program
MEIR	Master Environmental Impact Report
MHCP	Multiple Habitat Conservation Program
MLLW	mean lower low water
MND	Mitigated Negative Declaration
MSCP	Multiple Species Conservation Program
MSL	mean sea level
NAB	Naval Amphibious Base
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NOP	Notice of Preparation
NOS	National Ocean Survey
SANDAG	San Diego Association of Governments
SAOZ	Scenic Area Overlay Zone
SBMC	Solana Beach Municipal Code
TOT	Transient Occupancy Tax
USACOE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USSC	University of California Santa Cruz

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SUMMARY

Overview

For many years, the City of Solana Beach has recognized the problematic issue of a how to manage a continually eroding shoreline. The City includes 1.7 miles of narrow beach, backed with 75-foot-high seacliffs that are nearly completely built out with houses and condominiums. Seacliff erosion is a natural process occurring throughout San Diego County generally and in Solana Beach specifically, which in the last several decades has been greatly accelerated by the lack of sand replenishment due to the damming of, and mining in, coastal rivers that formerly carried to the ocean much greater amounts of sediment than are currently being delivered. The current approximate rate of erosion is estimated at an average of 0.4 feet per year, equating to a range of approximately 27 to 40 feet per 100 years. However, depending on multiple factors, such as wave action, winter storms, and upper bluff irrigation runoff, which contribute to cliff erosion in a given year, rates will vary. Seacliff erosion becomes an inevitable threat to public recreational use of the beach unprotected housing atop the upper bluffs. These are two of the primary reasons why shoreline protection management is and has been a critical issue in Solana Beach.

In response to the growing concern for protecting property within the City and the need to protect the natural coastal resources, the City enacted the existing Shoreline and Coastal Bluff Protection Ordinance in May of 1994. The goal of the ordinance was to help create a regulatory framework for balancing the protection of vested private property rights and important public interests in shoreline resources that can be harmed by the construction of coastal bluff protection measures (see Appendix A). The Ordinance was adopted against a backdrop of state law in which the California Coastal Act (Pub. Resources Code, § 30000 et seq.) already permitted property owners to build "[r]evetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes" as a means of protecting "existing structures" from erosion, provided that such structures were "designed to eliminate or mitigate adverse impacts on local shoreline sand supply." (Pub. Resources Code, § 30235.) Compared with state law, the Ordinance was intended to be proactive, in the sense that it favors the construction of small structures such as notch fills and sea cave fills when substantial erosion first begins to occur. State law, in contrast, had been applied by the California Coastal Commission in a manner that required the construction of large sea walls after erosion had become so bad that smaller, less intrusive structures could not be effective in protecting bluff-top structures and the beach-going public.

The City reviewed several drafts of the ordinance prior to adoption. During development of the draft ordinance, the City held several public workshops and received public comments, which helped to formulate and develop what is now the existing ordinance in place. In addition, the City satisfied the California Environmental Quality Act (CEQA) by preparing an Initial Study and adopting a Negative Declaration. Preparers of the Initial Study determined that the ordinance would not result in any significant impacts and as a result the City prepared a Negative Declaration. The Notice of Availability of the Negative Declaration was advertised on March 1, 1993 and underwent the 30-day review process. Following the 30-day review process, the City adopted the Negative Declaration and enacted the Shoreline and Coastal Bluff Protection Ordinance. The ordinance has been in effect since May 16, 1994. Since then, many members of the public have been concerned about the number of seawalls and other protective structures that have been permitted in the City in the last few years and their possible effect on the coastal erosion problems and the reduction of public access that Solana Beach and other San Diego region beaches are experiencing. As a result, even though CEQA has been satisfied, the City would like to revisit the issue as to how, if at all, it might want to modify the existing ordinance, or seek other policy alternatives, for managing the coastline. A public scoping meeting was held on April 10, 2001 regarding the preparation of an environmental document and public comments were considered in the preparation of this Master Environmental Impact Report (MEIR). A Notice of Preparation was prepared by the City on May 21, 2001 and sent out for public comment with a 30-day review period (see Appendix B).

This MEIR evaluates the environmental effects of the existing Shoreline and Coastal Bluff Protection Ordinance as well as the effects of potential policy and program alternatives, which could replace or be in addition to the existing policy, upon which the approval of subsequent future coastal management projects or adoption of other policies or programs could be based. This MEIR satisfies the requirements for MEIRs, as set forth in Public Resources Code section 21157 and "CEQA Guidelines" section 15176.

Study Area

The City of Solana Beach is located on the northern coast of San Diego County (Figure 1-1). The City is approximately 20 miles north of downtown San Diego, with neighboring cities including Encinitas to the north and Del Mar to the south. To the east are unincorporated areas of San Diego County, which include the communities of Rancho Santa Fe and Fairbanks Ranch, as well as San Dieguito Regional Park. The Pacific Ocean is located to the west and San Elijo Lagoon is located along the City's northern boundary. As shown in Figure 1-2, the project study area encompasses the coastal bluffs located within the boundaries of the City of Solana Beach. More specifically, the project study area comprises the properties located along 1.7 miles of beach within the City's boundaries and on the west side of Pacific Avenue and South Sierra Avenue.

MEIR Objectives

The purpose of this MEIR is to provide the City Council of Solana Beach and the public with an assessment of the potential environmental impacts associated with alternative strategies for managing the City's coastline. The goals and objectives of this MEIR are to consider the range of coastal management strategies or alternatives available to the City. This includes considering alternative policies or programs that would accomplish one of the following:

- Leave the current Ordinance in place, and thereby continue to attempt to balance the rights and privileges of shoreline property owners to preserve, protect, develop, and use their property with the rights of the general public to ensure protection of important natural shoreline and coastal bluff resources and processes

- Repeal the existing Shoreline and Coastal Bluff Protection Ordinance and let the California Coastal Commission and/or others regulate the construction of shoreline protection devices

- Reduce the need for shoreline protective structures by regularly importing sand resources and constructing retention devices as a way to maintain or increase the width of the Solana Beach

- Return the shoreline and coastal bluffs back to nature over time by implementing a Planned Retreat Policy whereby the City would not protect existing and future structures atop the shoreline bluffs

As will be explained in more detail in the body of this MEIR, implementation of the third option will likely require close coordination with, and major financial assistance from, the San Diego Association of Governments ("SANDAG") and agencies of the state and federal governments, as the City lacks the financial resources on its own either to fund the periodic importation of large amounts of sand or the construction of offshore retention devices. The fourth option, moreover, cannot be implemented by the City on its own because, as noted earlier, state law currently allows property owners to obtain permits from the Coastal Commission where shoreline defense structures are necessary to protect existing structures from erosion, provided that adequate mitigation is available. Thus, a change in state law will be necessary before, if ever, the City and the Coastal Commission can together implement a "Planned Retreat Policy."

Alternative Policies and Programs

There is no "proposed project" for this MEIR, in the sense that the City does not consider any particular option to be a tentative proposal more favored than other options. Instead, four alternatives have been developed and considered at an equal level of detail, so that the City Council can make a fully informed decision regarding whether to make any change in existing policies. The No Project Policy looks at the impacts of the continuation of the existing Shoreline and Coastal Bluff Protection Ordinance. The other three alternatives are different policies and programs, which could be implemented in replacement of, or in addition to, the existing policy. The alternative policies and programs, as follows, are described in detail in Section 2.0:

- Alternative 1 – No Project – Continuation of Existing Policy
- Alternative 2 – Repeal of the Shoreline and Coastal Bluff Protection Ordinance
- Alternative 3 – Sand Replenishment and Retention Program
- Alternative 4 – Planned Coastal Retreat Policy

Environmental Impacts

The environmental resource areas addressed in this MEIR are geology and soils, land use, biological resources, recreation and public access, population and housing, aesthetics, and utilities and service systems. Table S-1 summarizes the environmental impacts and mitigation measures associated with the alternatives. Significant impacts have been identified for geology and soils, biological resources, land use, recreation and public access, population and housing, and aesthetics for one or more of the alternatives. With the exception of impacts to aesthetics under Alternatives 1 and 2, recreation and public access under Alternative 3, and geology and soils, land use, and population and housing under Alternative 4, these significant impacts can be reduced to less than significant levels, provided that the City, working with other public agencies, can marshal the resources necessary to fund and implement the necessary mitigation.

Table S-1 Summary of Environmental Impacts and Mitigation Measures		
I. Unavoidable Significant Environmental Impacts Associated with Alternatives Without Changes to Fully Mitigate Them (Lead Agency must issue "Statement of Overriding Considerations" under Section 15093 and 15126[b] of the State CEQA Guidelines if the Agency determines these effects are significant and wishes to select this Alternative)		
Category/ Alternative	**Environmental Impacts**	**Mitigation**
Alternatives 1 & 2: [1]		
Aesthetics	The armoring of the entire coastal bluffs with seawalls or gunite covering could result in long-term, cumulative visual impacts.	Design features such as earth-like appearance, use of natural colors, and conformity to the natural form of the bluff would not reduce the cumulative impacts of armoring a natural coastal bluff to below a level of significance.
Alternative 2:		
Aesthetics	Alternative 2 does not promote the implementation of seacave plugging and filling over the construction of seawalls, bluff retaining walls, gunite covering, and similar permanent armoring for shoreline protection, which results in significant direct visual impacts.	Mitigation measures to reduce the direct visual impacts of seawalls, bluff retaining walls, gunite covering, and similar permanent armoring for shoreline protection could be implemented. Because the California Coastal Commission policy changes are out of the control of the City of Solana Beach, this would not be a feasible mitigation measure as far as the City is concerned, though the Coastal Commission itself could implement it.
Alternative 3:		
Recreation and Public Access	Cumulative impacts associated with sand retention structures such as groins and breakwaters include erosion on a downdrift beach unless beach nourishment is continual.	Design features such as pre-filling the updrift beach and short groin fields that allow sand to bypass and flow downdrift would lessen this impact; however, these mitigation measures would not reduce cumulative impacts below a level of significance.

[1] In the unique situation facing the City, standard CEQA terms – "environmental impacts" and "mitigation" – do not accurately convey the true nature of the consequences of Alternatives 1 and 2. Under Alternative 1, the City would take no action whatever, but would simply choose to leave the existing Ordinance unchanged. The City therefore would not be approving any "project" with "significant environmental effects." Thus, the City would not be subject to the CEQA statutory mandate requiring that the approval of a project with significant effects necessitates the approval of any "feasible" mitigation measures addressing such impacts. (See Pub. Resources Code, § 21002.) The City would therefore have unfettered discretion to decide whether to undertake, either on its own or in tandem with other agencies, any "mitigation measures" recommended in this MEIR. Under Alternative 2, the City would be repealing the Ordinance while leaving the Coastal Commission still subject to Coastal Act requirements mandating the issuance of permits for coastal protective structures in some instances. Under such a scenario, the City's action would not be the sole, or even the dominant, cause of any continuing negative consequences associated with the continuing approvals of shoreline protection structures, as the Coastal Commission would continue to approve such structures. Thus, as with Alternative 1, the City would have broad discretion as to whether to undertake any role in carrying out policies that might mitigate the effects of continuing Coastal Commission approvals.

Table S-1 (continued)
Summary of Environmental Impacts and Mitigation Measures

I. Unavoidable Significant Environmental Impacts Associated with Alternatives Without Changes to Fully Mitigate Them (Lead Agency must issue "Statement of Overriding Considerations" under Section 15093 and 15126[b] of the State CEQA Guidelines if the Agency determines these effects are significant and wishes to select this Alternative)

(Continued)

Category/ Alternative	Environmental Impacts	Mitigation
Alternative 4:		
Geology and Soils	This alternative would increase the potential for erosion, large-scale landsliding, and soil failure.	Warning signs or buffer zones would have to be established near the base of the bluff to reduce the potential for injury to the public by eroding soil or block falls. Even with these protections in place, lifeguard and public safety issues would be increased and would result in a significant public safety impact with this alternative. As bluffs crumbled or otherwise gave way to the forces of coastal erosion, people along the beach would be exposed to the risk of injury or possibly even death.
Land Use	Bluff top development regulatory policies requiring setback lines on the bluff would create new land use policies within the city that are not directly addressed within existing plans and policies. Creating setback lines would have significant cumulative impacts to this land use policy in the long term because it would eventually result in the elimination rather than the maintenance of residences located seaward of the setbacks. Property values would likely lessen as erosion of the bluff approached the setback lines and reduced the economic life of the property.	The impact to residential land use along the bluff tops from this alternative shall require a new policy to relocate and rebuild displaced structures or to compensate property owners in lieu of relocation and replacement. However, mitigation will not reduce impacts on land use from this alternative to less than significant levels. Elements of this new policy shall include: • provisions to adequately compensate homeowners for the economic loss of their property • provisions to relocate structures, if possible, to another property within the region • provisions to relocate residents and assist in the identification of residences of similar size and quality as the vacated property • changes to state Public Resources Code, §30235

Table S-1 (continued) Summary of Environmental Impacts and Mitigation Measures		
I. Unavoidable Significant Environmental Impacts Associated with Alternatives Without Changes to Fully Mitigate Them (Lead Agency must issue "Statement of Overriding Considerations" under Section 15093 and 15126[b] of the State CEQA Guidelines if the Agency determines these effects are significant and wishes to select this Alternative) **(Continued)**		
Category/ Alternative	**Environmental Impacts**	**Mitigation**
Alternative 4 (Continued):		
Land Use (Continued)	The City would be unable to implement this alternative on its own without a change in state law, which currently requires the California Coastal Commission to continue to approve shoreline and coastal bluff protection structures under certain circumstances. Thus, even if the City believed that a Planned Retreat policy were the best means of addressing coastal erosion problems, the Coastal Commission's current mandate would frustrate such an approach by requiring the continuing approval of seawalls and other protective structures when erosion problems required the approval of such structures in order to protect bluff-top properties. Furthermore, even if state law were changed so that this alternative could be implemented, the City and Coastal Commission would likely face privately initiated litigation from bluff-top property owners alleging the taking of their private property without just compensation. The outcome of such litigation is impossible to predict.	
Population and Housing	This alternative would also require the purchase of the land and/or property seaward of the planned retreat lines as property became increasingly threatened and dangerous to inhabit. This alternative would have adverse cumulative impacts in the long term to both population and housing because	Impact to population and housing under this alternative cannot be fully mitigated to less than significant levels. To compensate homeowners for the loss of their property, the City, state, or other responsible agency shall be required to purchase at full market value.

Table S-1 (continued)
Summary of Environmental Impacts and Mitigation Measures

I. Unavoidable Significant Environmental Impacts Associated with Alternatives Without Changes to Fully Mitigate Them (Lead Agency must issue "Statement of Overriding Considerations" under Section 15093 and 15126[b] of the State CEQA Guidelines if the Agency determines these effects are significant and wishes to select this Alternative)

(Continued)

Category/ Alternative	Environmental Impacts	Mitigation
Alternative 4 (Continued):		
Population and Housing (Continued)	property values would decrease over time as setback lines and required property acquisition would place time restrictions on ownership. Therefore, under this alternative, impacts to population and housing would be adverse.	
II. Significant Environmental Impacts That Can Be Avoided or Mitigated (Section 151 26[c] of the State CEQA Guidelines)		
Geology and Soils		
Alternatives 1 & 2	Long-term Loss of Beach Width	This can be mitigated using artificial beach replenishment provided the program is properly designed to maintain a protective beach width in front of the structures.
	Reduction in Sediment Contribution to Littoral Zone	This can be mitigated in a similar fashion as the loss of beach by using artificial beach replenishment.
	Beach Encroachment/ Placement of the Protection Structure	This can be mitigated by locating the protective structure as close as possible to the base of the seacliff. The dynamic effect can be mitigated in a similar fashion as above, by artificial beach replenishment.
	Wave Reflection	Appropriate design features can mitigate increased wave reflection. Sand loss impacts from reflection not mitigated through design can be mitigated through sand banking in coordination with the mitigation of other consequences.

Table S-1 (continued) Summary of Environmental Impacts and Mitigation Measures		
II. Significant Environmental Impacts That Can Be Avoided or Mitigated (Section 15126[c] of the State CEQA Guidelines) (Continued)		
Geology and Soils (Continued)		
Alternatives 1 and 2 (Continued)	Erosion of Tidal Terrace	Mitigation for the lack of a tidal terrace can be provided by sand replenishment (see above). It should be noted, however, that even prior to the recent beach replenishment, only a limited area of the coast had the tidal terrace exposed and almost the entire beach was covered by sand.
	End Scour	End scour would most likely be mitigated by construction of an additional protective seawall or riprap revetment at the end of the subject seawall, or by a combination of sand replenishment and/or groin system.
Alternative 3	Artificial sand retention devices such as breakwaters and reefs would impound sand behind the structure. Groin fields could cause potential downcoast erosion.	Mitigation measures to offset the impoundment of sand behind breakwaters and reefs would include pre-filling the area behind the retention structure (salient volume) with sand imported from outside of the littoral system. Pre-filling the groin field, extending sand bypassing, regular beach monitoring, and possible sand replenishment would mitigate downcoast erosion caused by groin fields.
Alternative 4	Differential Erosion	To mitigate differential erosion along the beach, existing protective devices (seawalls, riprap, seacave in-fills, notch in-fills, etc.) should be removed and natural erosion allowed to occur, if permissible under state law. As these devices are removed, blockfalls, landslides, and/or areas of accelerated erosion may occur. Safe buffer zones should be established at the base of the seacliff for public safety. Additionally, the coastal bluff stability should be evaluated and mitigative measures implemented to increase static and dynamic slope stability, if necessary. These measures may include “flattening” or decreasing the slope inclination (angle) of the upper and lower bluff to make the slope more stable. Structures and utilities at and for a distance landward from the top of the bluff should be removed so that bluff retreat does not cause a safety hazard when the bluff (and the improvements supported by the bluffs) fails.

Table S-1 (continued)
Summary of Environmental Impacts and Mitigation Measures

II. Significant Environmental Impacts That Can Be Avoided or Mitigated (Section 15126[c] of the State CEQA Guidelines) (Continued)

Category/ Alternative	Environmental Impacts	Mitigation
Land Use		
Alternative 4	Inconsistent with the City's General Plan and the California Coastal Act	The impact to residential land use along the bluff tops from this alternative shall require a new Solana Beach General Plan policy to relocate and rebuild displaced structures, as well as, ideally, new state statutes addressing the same issues. To mitigate land use impacts from this alternative to less than significant levels, elements of new policies could include one or more of the following: • provisions to adequately compensate homeowners for the economic loss of their property[2] • provisions to relocate structures, if possible, to another property within the region • provisions to relocate residents and assist in the identification of residences of similar size and quality as the vacated property
Biological Resources		
Alternative 3	Implementation of types of retention structures (groins) could have significant impacts to reef habitat. Temporary turbidity impacts to endangered least tern nesting sites within the area could result during construction of breakwaters or reefs.	The following mitigation was developed for artificial sand retention, reefs, breakwaters, and groins within the Regional Beach Sand Retention Strategy by SANDAG: • Avoid construction in reef habitat area • Create hard substrate subtidal habitat when rocky groins are implemented • Avoid construction during least tern nesting season • Implement an environmental monitoring program during sand replenishment and construction operations

[2] The provision of financial compensation is not, strictly speaking, a mitigation measure for an "environmental" impact subject to CEQA. Rather, such compensation is proposed as an *economic* measure intended to avoid financial effects that would occur under a Planned Retreat Policy. Such compensation would not be a requirement of CEQA.

Table S-1 (continued)
Summary of Environmental Impacts and Mitigation Measures

II. Significant Environmental Impacts That Can Be Avoided or Mitigated (Section 151 26[c] of the State CEQA Guidelines) (Continued)

Category/ Alternative	Environmental Impacts	Mitigation
Recreation and Public Access		
Alternatives1 & 2	Long-term Loss of Beach Width	This can be mitigated using artificial beach replenishment provided the program is properly designed to maintain a protective beach width in front of the structures.
	Reduction in Sediment Contribution to Littoral Zone	This can be mitigated with ongoing beach replenishment.
	Beach Encroachment/Placement of the Protection Structure	This can be mitigated by locating the protective structure as close as possible to the base of the seacliff.
	Wave Reflection	This can be mitigated through proper design techniques as described in Section 3.1.
	Erosion of Tidal Terrace	This impact can be mitigated with sand replenishment.
Alternative 2	Impacts from seawalls to recreation and lateral beach access would be more significant as compared to seacave and notch fills. Seawalls could fix the landward boundary of the beach, reduce the amount of beach, increase the reflection of wave energy, and the erosion of the tidal terrace. Seacave and notch fills, in contrast, could fix the landward boundary of the beach, increase the reflection of wave energy, and the erosion of the tidal terrace, but would not reduce the amount of beach as would occur with seawalls.	Alternative 2 is not as proactive as the City's Shoreline and Bluff Protection Ordinance, which encourages seacave and notch fills over seawall construction in order to avoid the greater environmental impacts associated with seawalls. The City of Solana Beach could encourage the California Coastal Commission to revise its current policy and take a more proactive approach to coastal bluff protection similar to the approach embodied in the City's Ordinance, which helps to reduce the impacts of seawalls. However, since California Coastal Commission policy changes are out of the control of the City of Solana Beach, this would not be a feasible mitigation measure as far as the City is concerned, though the Coastal Commission itself could implement it.
Alternative 3	Potential loss of surfing opportunities with the construction of breakwaters and possible improvement to surfing at nearby groins, which would require further study.	Loss of surfing opportunities resulting from the construction of breakwaters could be mitigated with the construction of a separate artificial surf reef, for the sole purpose of enhanced surfing opportunities.

Table S-1 (continued)
Summary of Environmental Impacts and Mitigation Measures

II. Significant Environmental Impacts That Can Be Avoided or Mitigated (Section 151 26[c] of the State CEQA Guidelines) (Continued)

Category/ Alternative	Environmental Impacts	Mitigation
Recreation and Public Access (cont.)		
Alternative 3 (Continued)	Construction of artificial structures, such as a reef, in the surf zone could pose a public safety hazard to swimmers, surfers, and boaters.	Potential mitigation measures to reduce safety impacts to swimmers, surfers, and boaters from the construction of reefs could include public education, increased lifeguard patrol services, and clear and effective signage.
Alternative 4	This alternative could prevent repairs to destroyed public access structures (stairs) and would consequently restrict beach access.	Exempt public access structures from the "no new development" policy based on 50- and 100-year setback lines. This would allow for continual maintenance and new development of access structures to maintain adequate beach access.
Population and Housing		
Alternative 4	This alternative would result in a potential decrease in property values and an increase in vacancy rates.	To compensate homeowners for the loss of their property, the City, state, or other responsible agency shall be required to purchase at full market value.
Aesthetics		
Alternative 1	• Natural appearance at the bluffs could change significantly from the beach and from residences. • Seawalls and gunite covering strong line and form could pose a significant visual impact to bluffs.	In addition to the requirements of the City's Ordinance, significant visual impacts to the bluffs can be further mitigated as follows: • Seawalls should be designed and constructed with: - natural-looking facades with undulating forms and lines - coarse textures • Gunite covering should be designed and constructed with: - undulating form and lines - addition of planting pockets consisting of ornamental or native vegetation to blend in with existing adjacent vegetation - coarse textures • Seacave fills and plugs should be constructed with: - undulating form and lines - coarse textures

Table S-1 (continued) Summary of Environmental Impacts and Mitigation Measures		
II. Significant Environmental Impacts That Can Be Avoided or Mitigated (Section 151 26[c] of the State CEQA Guidelines) (Continued)		
Category/ Alternative	**Environmental Impacts**	**Mitigation**
Aesthetics (Continued)		
Alternative 2	Seawalls pose a higher cumulative visual impact than would seacave plugs or fills; therefore, Alternative 2 would pose a higher cumulative visual impact than Alternative 1.	Alternative 2 is not as proactive as the City's Shoreline and Bluff Protection Ordinance, which encourages seacave and notch fills over seawall construction in order to avoid the greater environmental impacts associated with seawalls. The City of Solana Beach could encourage the California Coastal Commission to revise its current policy and take a more proactive approach to coastal bluff protection similar to the approach embodied in the City's Ordinance, which helps to reduce the impacts of seawalls. However, since California Coastal Commission policy changes are out of the control of the City of Solana Beach, this would not be a feasible mitigation measure as far as the City is concerned, though the Coastal Commission itself could implement it.

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1.0 INTRODUCTION

The purpose of this MEIR is to provide the City of Solana Beach Council and the public with an assessment of the potential environmental impacts associated with alternative policies or programs for managing the City's coastline. The MEIR also is intended to provide a detailed review of proposed coastal management policies and programs upon which the approval of subsequent related coastal management projects or the adoption of coastal management policies/programs could be based. The City is the lead agency responsible for compliance with the CEQA statutes (Pub. Resources Code, § 21000 et seq., as amended).

1.1 Study Area

The City of Solana Beach is located on the northern coast of San Diego County (Figure 1-1). The City is approximately 20 miles north of downtown San Diego, with neighboring cities including Encinitas to the north and Del Mar to the south. To the east are unincorporated areas of San Diego County, which include the communities of Rancho Santa Fe and Fairbanks Ranch, as well as San Dieguito Regional Park. The Pacific Ocean is located to the west and San Elijo Lagoon is located along the City's northern boundary. As shown in Figure 1-2, the project study area encompasses the coastal bluffs located within the boundaries of the City of Solana Beach. More specifically, the project study area comprises the properties located along 1.7 miles of beach within the City's boundaries and on the west side of Pacific Avenue and South Sierra Avenue.

1.2 History and Background

Beach sand is a product of weathering of the land. The primary natural source for the region's beaches is sediment carried from inland areas by rivers and streams. Over the past half-century, human actions have been the major influence affecting the shoreline. Through urban development activities, including water reservoir and dam building, flood control systems, and sand mining, natural sediment transport has been hindered or eliminated. Most major coastal streams have at least one dam and reservoir. Much of the fresh water that naturally flows to coastal wetlands is diverted to farms and cities. These dams reduce the size of flood flows and thus reduce the flushing of sediment from estuaries. They also trap sand that would otherwise nourish coastal beaches. This beach sand is the primary buffer protecting seacliffs and coastal development from erosion and storm damage. To offset the loss of natural sand sources no longer reaching the shoreline, previous projects have built "man-made" beaches. Most of the sand for this purpose has come from the massive harbor dredging projects in San Diego Bay and Oceanside Harbor.

The natural sand cycle is a seasonal process. For the San Diego region, beach sand loss typically occurs in the winter due to large storms and waves, followed by a period of sand gain during the summer's gentler storms and surf. During the winter, sand shifts from the beach

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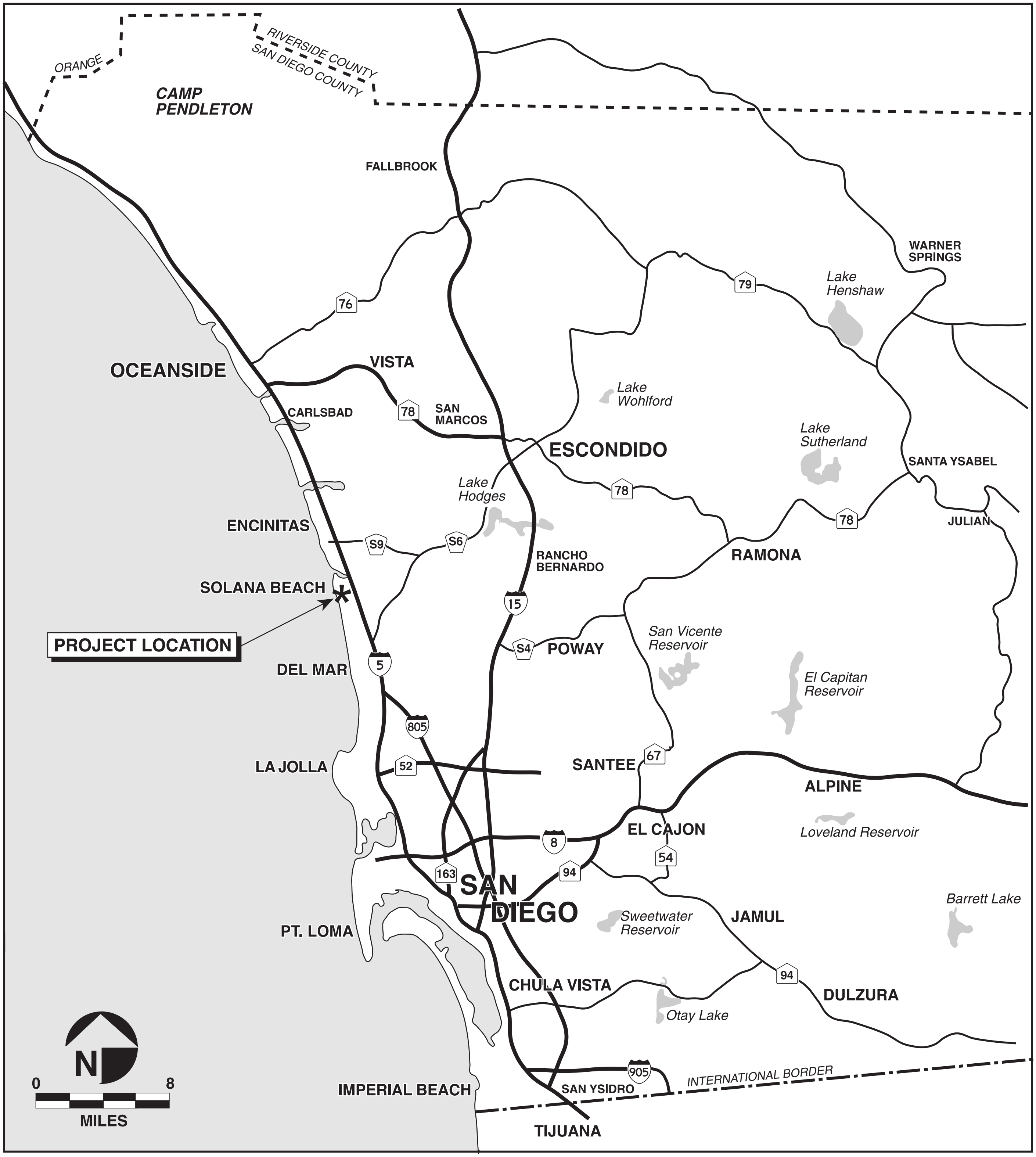

FIGURE

1-1

Regional Location Map

amec

Environmentl/Solana Beach Bluff Ord EIR/**Solana Beach County Map.FH8**

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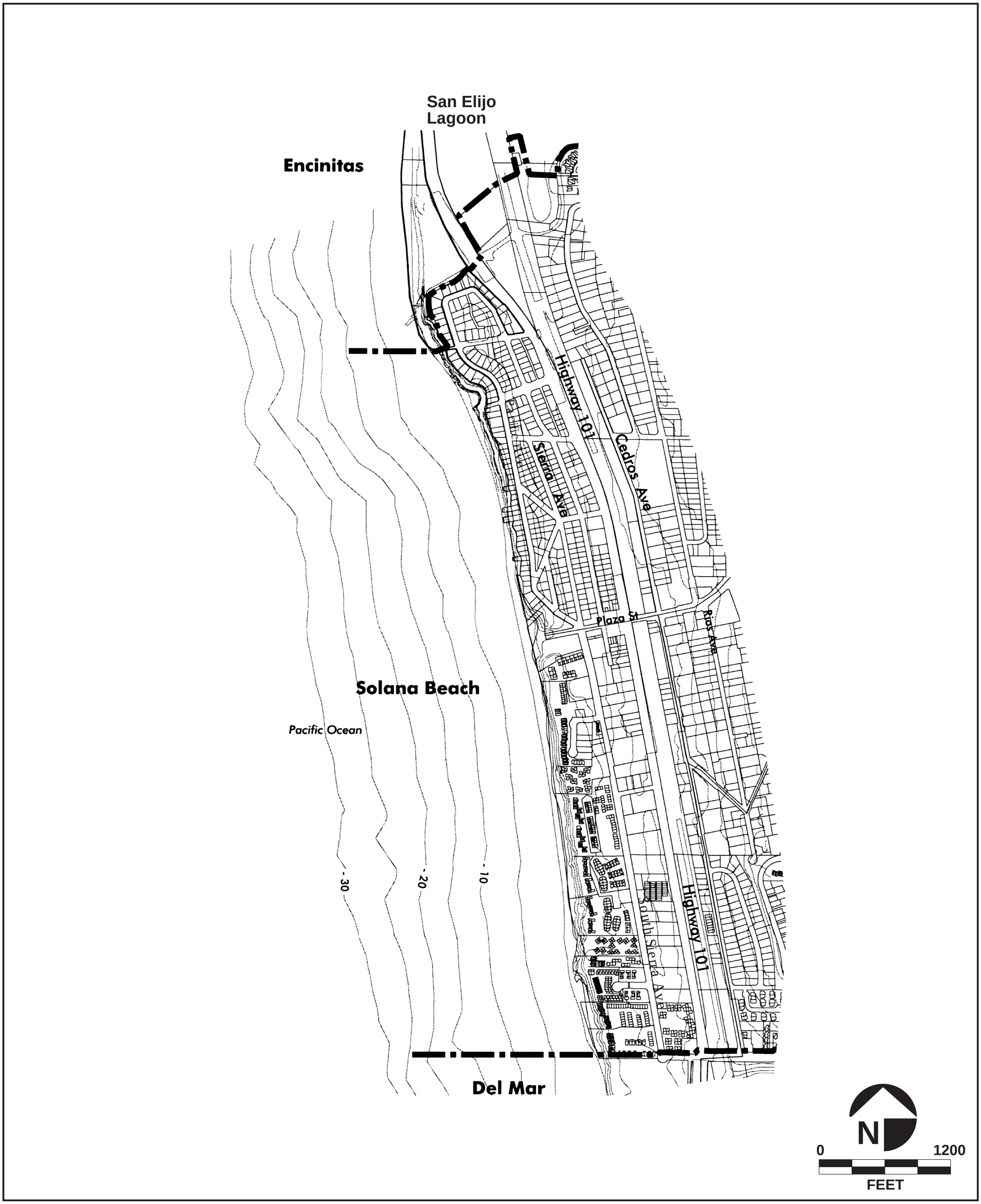

FIGURE

1-2

Project Vicinity Map

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above the mean sea level to the larger portion of the beach offshore covered by seawater. These combined seasonal processes, including both winter and summer sand shifts, comprise a complete sedimentation cycle.

A coastal segment that contains a complete sedimentation cycle is defined as a littoral cell. It is the dynamic interface between the ocean and land. Along the San Diego region's coast, there are three littoral cells that cycle sand on and off the beaches (Figure 1-3). Bounded on one side by the landward limit of the beach and extending seaward beyond the area of breaking waves, a littoral cell is the region where wave energy dissipates. Littoral cells are physically interconnected; occurrences in one part of a littoral cell will ultimately have an impact on other parts. The three littoral zones off of the San Diego region include the southern half of the Oceanside Littoral Cell, the Mission Bay Littoral Cell, and the Silver Strand Littoral Cell.

Solana Beach is an isolated beach within the southern half of the Oceanside Littoral Cell. It does not have any major river, stream, or cliff resources that continually provide sufficient sand supply to the beach. Thus, the City's beaches are experiencing a net loss of sand. The reach from southern Oceanside to northern Del Mar is dependent on longshore transport of sand from the north and south. Longshore sand transport is driven by waves breaking at an angle to the shoreline. Transport is generally southward in winter and northward in summer. Estimates of long-term transport potential average about 750,000 cubic yards of sand per year to the south, and 550,000 cubic yards per year to the north. This means that a total of 1,300,000 cubic yards of gross sand transport per year are capable of being mobilized, with a net southward rate of 200,000 cubic yards per year.

Sand also moves onshore and offshore. Typically, between 10 and 35 cubic yards per yard of beach move back and forth between winter and summer. In big storm events, up to 100 or more cubic yards per yard may be lost offshore. Under the present conditions of sand starvation, the small contribution from cliff erosion in Solana Beach gets immediately swept away.

Seacliff erosion is a natural process occurring throughout San Diego County generally and in Solana Beach specifically, which in the last several decades has been greatly accelerated by the lack of sand replenishment due to the damming of, and mining in, coastal rivers that formerly carried to the ocean much greater amounts of sediment than are currently being delivered. Current approximate rates of erosion are estimated at an average of 0.4 feet per year, equating to a range of approximately 27 to 40 feet per 100 years. However, depending on multiple factors, such as wave action, winter storms, and upper bluff irrigation runoff, which contribute to cliff erosion in a given year, rates will vary. Seacliff erosion becomes an inevitable threat to unprotected housing atop the upper bluffs. Even if all of the existing seawall and shoreline protection structures were removed, Solana Beach would still experience a sand shortage. For instance, even at a high rate of 6 cubic yards per yard per year of cliff sand contribution, the entire 1.7 miles (2,500 yards) of Solana Beach Coastline would contribute less than 15,000 cubic yards of sand per year. This is the primary reason why shoreline protection management is and has been a critical issue in Solana Beach.

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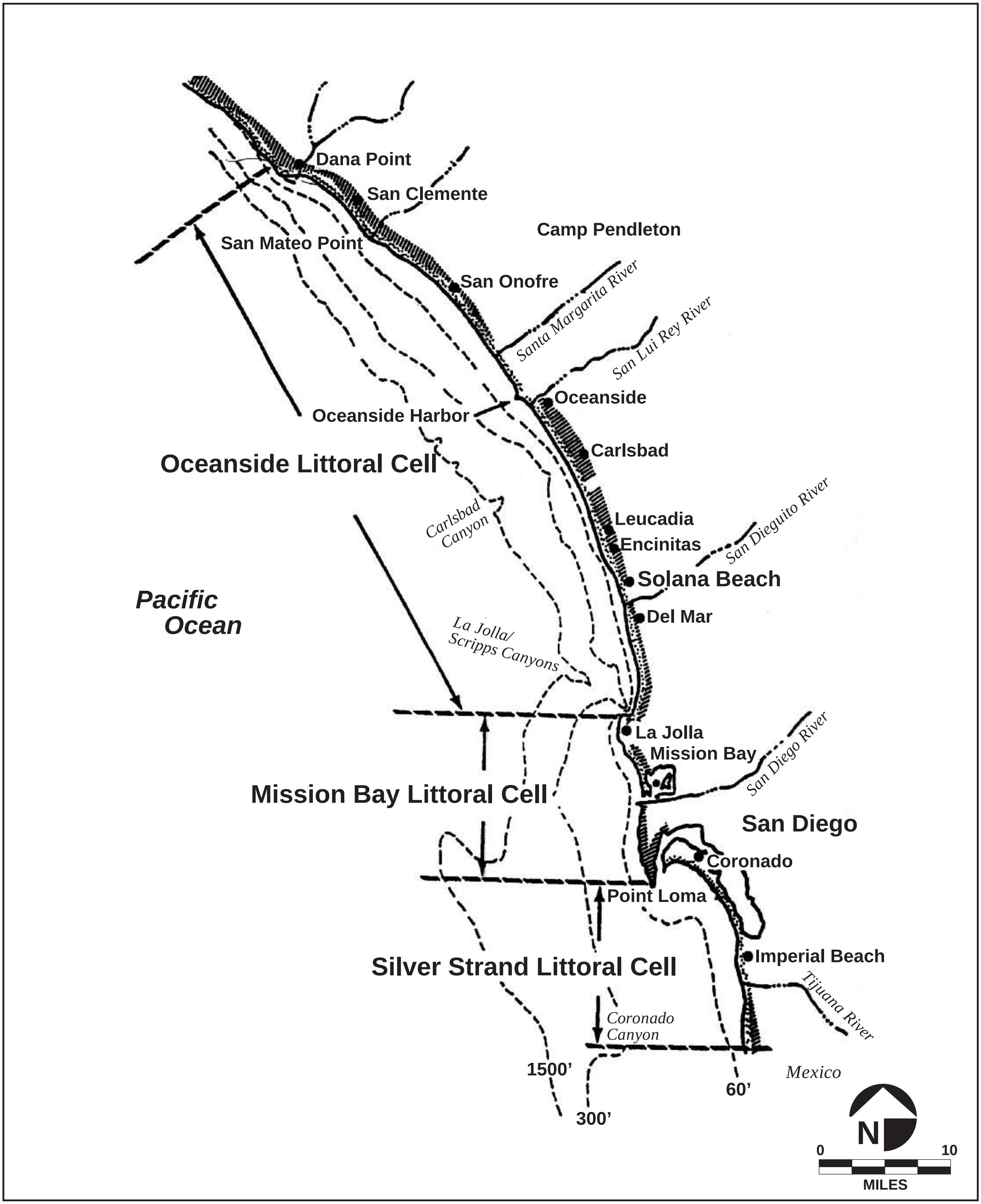

FIGURE

1-3

Littoral Cells in the San Diego Region

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In response to the growing concern for protecting property within the City and the need to protect the natural coastal resources, the City enacted the Shoreline and Coastal Bluff Protection Ordinance in May of 1994. The goal of the ordinance was to help create a regulatory framework for balancing the protection of vested private property rights and important public interests in shoreline resources that can be harmed by the construction of coastal bluff protection measures (see Appendix A). The Ordinance was adopted against a backdrop of state law in which the California Coastal Act (Pub. Resources Code, § 30000 et seq.) already permitted property owners to build "[r]evetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes" as a means of protecting "existing structures" from erosion, provided that such structures were "designed to eliminate or mitigate adverse impacts on local shoreline sand supply." (Pub. Resources Code, § 30235.) Compared with state law, the Ordinance was intended to be proactive, in the sense that it favors the construction of small structures such as notch fills and sea cave fills when substantial erosion first begins to occur. State law, in contrast, had been applied by the California Coastal Commission in a manner that required the construction of large sea walls after erosion had become so bad that smaller, less intrusive structures could not be effective in protecting bluff-top structures and the beach-going public.

The City reviewed several drafts of the ordinance prior to adoption. During development of the draft ordinance, the City held several public workshops and received public comments, which helped to formulate and develop what is now the existing ordinance. In addition, the City satisfied CEQA by preparing an Initial Study and adopting a Negative Declaration. Preparers of the Initial Study determined that the ordinance would not result in any significant impacts and as a result the City prepared a Negative Declaration. The Notice of Availability of the Negative Declaration was advertised on March 1, 1993 and underwent a 30-day review process. Following the 30-day review process, the City adopted the Negative Declaration and enacted the Shoreline and Coastal Bluff Protection Ordinance. The ordinance has been in effect since May 16, 1994. Since then, many members of the public have been concerned about the number of seawalls and other protective structures that have been permitted in the City in the last few years and their possible effect on the coastal erosion problems and the reduction of public access that Solana Beach and other San Diego region beaches are experiencing. As a result, even though CEQA has been satisfied, the City would like to revisit the issue as to how, if at all, it might want to modify the existing ordinance, or seek other policy alternatives, for managing the coastline. A public scoping meeting was held on April 10, 2001 regarding the preparation of an environmental document and public comments were considered in the preparation of this MEIR. A Notice of Preparation was prepared by the City on May 21, 2001 and sent out for public comment with a 30-day review period (see Appendix B).

1.3 Goals and Objectives

As stated above, the purpose of this MEIR is to provide the City Council of Solana Beach and the public with an assessment of the potential environmental impacts associated with alternative policies or programs for managing the City's coastline and for which subsequent coastal management projects or adoption of proposed policies or programs can be based. The goals and objectives of this MEIR are to consider the range of coastal management policies or programs available to the City. This includes considering policy and program alternatives that would accomplish one of the following:

- Leave the Ordinance in place, and thereby continue to attempt to balance the rights and privileges of shoreline property owners to preserve, protect, develop, and use their property with the rights of the general public to ensure protection of important natural shoreline and coastal bluff resources and processes

- Repeal the existing Shoreline and Coastal Bluff Protection Ordinance and let the California Coastal Commission and/or others regulate the construction of shoreline protection devices

- Reduce the need for shoreline protective structures by regularly importing sand resources and constructing retention devices as a way to maintain or increase the width of Solana Beach

- Return the shoreline and coastal bluffs back to nature over time by implementing a Planned Retreat Policy whereby the City would not protect existing and future structures atop the shoreline bluffs

As will be explained in more detail in succeeding chapters of this MEIR, implementation of the third option will likely require close coordination with, and major financial assistance from, SANDAG and agencies of the state and federal governments, as the City lacks the financial wherewithal on its own either to fund the periodic importation of large amounts of sand or the construction of offshore retention devices. The fourth option, moreover, cannot be implemented by the City on its own because, as noted earlier, state law currently allows property owners to obtain permits from the Coastal Commission where shoreline defense structures are necessary to protect existing structures from erosion, provided that adequate mitigation is available to address the loss of sand along the beach. Thus, a change in state law will be necessary before, if ever, the City and the Coastal Commission can together implement a "Planned Retreat Policy."

In weighing the options set forth above, the City Council will consider the following formal project objectives (see CEQA Guidelines, § 1524, subd. (b)):

- Adopt, continue, or modify local policies governing shoreline erosion issues so that they achieve an acceptable balance between environmental, economic, and social considerations;

- Take action that will not be at odds with state law as embodied in statutes, regulations, and state agency policies that are likely to remain in effect for the reasonably foreseeable future or are likely to be adopted in the reasonably foreseeable future;

- Take action that is fiscally responsible and realistic in light of (1) the amount of city funds that can be responsibly devoted to dealing shoreline erosion issues, (2) the amount of federal, state, or regional assistance that can be expected to be forthcoming in the reasonably foreseeable future, and (3) the direction that is likely to be followed by SANDAG in the reasonably foreseeable future; and

- Minimize the likelihood that any change in City policy will constitute an unconstitutional taking of private property for which the City would be required to pay just compensation on a scale beyond the means of the City to pay within a reasonably foreseeable time frame.

1.4 Areas of Known Controversy

Policy decisions are usually controversial. In this particular case, the City is considering a variety of policy decisions regarding how to manage the coastline in the future. On one hand are the existing property owners who have significant investment and resources associated with their property. These individuals could lose their property and/or equity through a variety of means including, but not limited to, a forced buy out, eminent domain, drastic reduction in property values, loss due to coastal erosion and cliff failures from natural forces, or inability to adequately protect their property. On the other hand, the City recognizes that the California coastline is eroding and structural improvements may or may not be viable for protecting some of the properties that were built too low and too close to the ocean in the short and long term. In addition, structural improvements and man-made solutions have adverse environmental impacts to natural coastal processes. As a result, this MEIR provides an objective evaluation of those potential impacts so the City and the public can make informed decisions about the tradeoffs and impacts of those decisions on how to manage the coastline.

1.5 Intended Use of the MEIR

This MEIR serves as an informational document for the City to use in making decisions on how to continue managing the Solana Beach coastline. There is no “proposed project” as there typically is in a CEQA document. Instead, the MEIR evaluates the potential impacts of the range of alternative coastline management strategies available to the City, each of which is considered a separate alternative, and any one of which could be adopted based on this MEIR. The purpose of this information is to help City decision-makers and the general public understand the consequences and tradeoffs associated with adopting any one or a combination of coastline management alternatives. However, this MEIR is not intended to be an all-encompassing technical document. There are several significant studies being conducted by federal and state agencies that will provide significant detail as to the coastal geologic processes and the region’s problems with coastal erosion and potential alternative solutions. Most notably, the U.S. Army Corps of Engineers (USACOE) is currently conducting such an investigation and the results are expected to be available in 2003. Other ongoing related studies are summarized in Table 1-1.

This MEIR is intended to be a programmatic or policy-level document to assist the City in deciding whether they will continue to ultimately protect private property rights, let the California Coastal Commission manage the coastline, take an active stance in maintaining the beach width through artificial means, or let the shoreline eventually return to its natural condition.

Table 1-1
Related Shoreline and Coastal Bluff Studies

Agency/Organization Name	Purpose of Study	Time Frame of Study
So. California Coastal Water Research Project	State of the Beach in Southern California – extent of beaches	Begin San Diego County mid to late 2001
Surfrider Foundation	Beachscape – inventory of what is on our beaches	Volunteer Effort – date unknown
University of California, San Diego	Effectiveness of Coastal Bluff Protection Devices	July 2001-2004, 3-year/3-phase study
University of California, Santa Cruz	Coastal Bluff Erosion and Contribution to Littoral Cells	June 2001 – Coastal Cliff Assessment
U.S. Army Corps of Engineers	Bluff Protection Feasibility Study for Cities of Encinitas and Solana Beach	December 2001 – Baseline Report; 2002 – Alternative Analysis

Various approvals and permits would be necessary for implementation of subsequent projects of the proposed alternatives. Table 1-2 lists the permits and approvals required for each alternative. The agencies that may issue the permits or approvals may use the information presented in this MEIR to assist in the decision-making process.

Table 1-2
Matrix of Key Approvals and Permits

	Alternative 1 **Continuation of Existing Policy**	**Alternative 2** **Repeal of the Shoreline and Coastal Bluff Protection Ordinance**	**Alternative 3*** **Sand Replenishment and Retention Program**	**Alternative 4** **Planned Coastal Retreat Policy**
U.S. Army Corps of Engineers			404 Permit	
Regional Water Quality Control Board			401 Certification Order	
California Coastal Commission	Coastal Consistency Determination/Coastal Development Permit	Coastal Consistency Determination/Coastal Development Permit	Coastal Consistency Determination/Coastal Development Permit	Coastal Consistency** Determination/Coastal Development Permit
California State Lands Commission	Lease Agreement for Utilization or Encroachments onto State Sovereign Lands***	Lease Agreement for Utilization or Encroachments onto State Sovereign Lands***	Possible Lease Agreement for Utilization or Encroachments onto State Sovereign Lands***	
City of Solana Beach	Coastal Development Permit			

* Other reviewing and participating agencies for Alternative 3 could include SANDAG, California Department of Fish and Game, California Department of Parks and Recreation, San Diego Air Pollution Control District, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, National Marine Fisheries Service, State Water Resources Board, and the City of Solana Beach.
** Removal of debris, repairs to beach access stairs, etc. may require a permit from the Coastal Commission.
*** The legal boundary between state sovereign lands and private property is the ordinary high water mark (California Civil Code § 830), which has been interpreted by the courts as the mean high tide line when in a natural condition. The artificial building of a beach does not act to move that boundary seaward; rather that boundary becomes fixed at its last natural location prior to artificial influences. The California State Lands Commission may require a mean high tide line survey or study to document the location of the mean thigh tide line prior to any artificial influence. Such a survey or study may extend beyond the actual location of sand placement to include the entire area of sand transport.

1.5.1 General Legal Principles Governing the Preparation of Master EIRs and Environmental Analysis for "Subsequent Projects" Identified in MEIRs

A "master EIR" is a mechanism for doing thorough programmatic environmental impact analysis in a single EIR prepared for a particular policy program, to be followed by more focused environmental analysis for later "subsequent projects" consistent with the approved policy program. CEQA Guidelines section 15175, subdivision (a), states that:

> "The Master EIR procedure is an alternative to preparing a project EIR, staged EIR, or program EIR for certain projects which will form the basis for later decision making. It is intended to streamline the later environmental review of projects or approval included within the project, plan or program analyzed in the Master EIR. Accordingly, a Master EIR shall, to the greatest extent feasible, evaluate the cumulative impacts, growth

inducing impacts, and irreversible significant effects on the environment of subsequent projects."

Thus, MEIRs are designed to eliminate, or reduce the scope of, environmental review of subsequent discretionary activities or projects whose environmental effects are addressed in the MEIR. An MEIR may be prepared for, among other things, "[a] rule or regulation that will be implemented by subsequent projects" or "[a] project that consists of smaller individual projects that will be carried out in phases." (Pub. Resources Code, § 21157, subd. (a); see also CEQA Guidelines, § 15175, subd. (b).) The City has chosen to avail itself of the use of an MEIR because all the alternative policy scenarios analyzed herein would fit within these broad categories of agency action. Furthermore, the City is aware that each proposal to construct a shoreline protective device raises environmental issues that are common to virtually all such structures. This fact makes the preparation and ultimate certification of an MEIR addressing these common issues an efficient and logical means of formulating policy options to react to these common issues.

According to the CEQA Guidelines, an MEIR shall include a proposed project's significant environmental effects, growth-inducing effects, mitigation measures, and alternatives, as well as "[a] description of anticipated subsequent projects that are within the scope of the Master EIR, including information with regard to the kind, size, intensity, and location of the subsequent projects, including, but not limited to all of the following":

- The specific type of project anticipated to be undertaken;
- The maximum and minimum intensity of any anticipated subsequent project;
- The anticipated location for any subsequent development projects, and, consistent with the "rule of reason"; and
- "[a] capital outlay or capital improvement program, or other scheduling or implementing device that governs the submission and approval of subsequent projects, or an explanation as to why practical planning considerations render it impractical to identify any such program or scheduling or other device at the time of preparing the Master EIR."

An MEIR shall also include "[a] description of potential impacts of anticipated projects for which there is not sufficient information reasonably available to support a full assessment of potential impacts in the Master EIR." (CEQA Guidelines, § 15176.)

After an agency such as the City of Solana Beach has prepared and certified an MEIR including these contents, the approval of a "subsequent project" identified in the MEIR will require either (1) a finding that, because the project is "within the scope" of the MEIR and earlier project, no new environmental analysis is necessary; (2) a "mitigated negative declaration"; (3) a "focused EIR"; or (4), where the MEIR is inadequate in dealing with specified issues, an ordinary EIR.

Just what form the “limited environmental review” for later projects will take depends on a number of factors. First, the lead agency for the subsequent project must prepare an initial study for the project. The initial study must analyze whether: (1) the subsequent project may cause any *additional significant effect on the environment* that was not previously examined in the MEIR; and (2) whether the subsequent project was described in the MEIR as being within the scope of the project. (Pub. Resources Code, § 21157.1, subd. (b); CEQA Guidelines, § 15177, subd. (b)(2).). These inquiries will determine whether the subsequent project can be approved (1) without any additional environmental review, (2) with a mitigated negative declaration, (3) with a focused EIR; or (4) with an ordinary EIR.

1.5.1.1 Finding a Subsequent Project to be "Within the Scope" of the Earlier Project and Master EIR

If, based on an initial study, a lead agency such as the City determines (1) that the proposed subsequent project will have no “additional significant effect on the environment” that was not identified already in the MEIR, and (2) that no “new or additional mitigation measures or alternatives may be required,” the lead agency’s review is complete. (Pub. Resources Code, § 21157.1, subd. (c); CEQA Guidelines, § 15177, subd. (b).) The lead agency must then prepare a written finding, based upon the information contained in the initial study, stating that the proposed subsequent project is “within the scope of the project covered by the [MEIR].” (Pub. Resources Code, § 21157.1, subd. (c); CEQA Guidelines, § 15177, subd. (b)(3).).

Before approving or carrying out the proposed subsequent project, the lead agency both must provide the same type of public notice required when an EIR or negative declaration is made available for public review (see Pub. Resources Code, § 21092) and must “incorporate all feasible mitigation measures or feasible alternatives set forth in the [MEIR] which are appropriate to the project.” (Pub. Resources Code, § 21157.1, subd. (c); CEQA Guidelines, § 15177, subd. (d).) The lead agency must file a notice of determination pursuant to Public Resources Code section 21152. (Pub. Resources Code, § 21157.1, subd. (c); CEQA Guidelines, § 15177, subd. (e).).

1.5.1.2. Preparing a Mitigated Negative Declaration for a Subsequent Project Identified in a Master EIR

Whether a “subsequent project” that is *not* “within the scope” of the larger project addressed by the MEIR qualifies for either a mitigated negative declaration or a focused EIR (as opposed to an ordinary EIR) depends on whether the MEIR adequately addresses “cumulative impacts, growth-inducing impacts and irreversible significant effects” for purposes of the subsequent project. (CEQA Guidelines, § 15178, subds. (a), (b); Pub. Resources Code, § 21158, subd. (a).) If the MEIR addresses these issues adequately, either a mitigated negative declaration or a focused EIR may suffice. If the MEIR falls short on these issues, the lead agency must prepare an ordinary EIR.

After having determined that the MEIR adequately addresses the above-referenced "big picture" issues, the lead agency shall prepare a mitigated negative declaration for a "subsequent project" not "within the scope" of the larger project and MEIR "if both of the following occur":

"(1) The initial study . . . has identified potentially new or additional significant environmental effects that were not analyzed in the Master EIR; and

(2) Feasible mitigation measures or alternatives will be incorporated to revise the subsequent project before the negative declaration is released for public review . . . in order to avoid or mitigate the identified effects to a level of insignificance."

(CEQA Guidelines, § 15178, subd. (b); see also Pub. Resources Code, § 21157.5, subd. (a).)

If the agency cannot prepare a mitigated negative declaration for the proposed subsequent project and there is "substantial evidence in light of the whole record" that the project may have a significant effect on the environment, the lead agency must prepare a "focused EIR."(CEQA Guidelines, § 15178, subd. (c); Pub. Resources Code, § 21157.5, subd. (b).)

1.5.1.3. The Use of Focused EIRs for Subsequent Projects Identified in a Master EIR

"The focused EIR shall incorporate by reference the Master EIR and analyze only the subsequent project's additional significant environmental effects and any new or additional mitigation measures or alternatives that were not identified and analyzed by the Master EIR." (CEQA Guidelines, § 15178, subd. (c)(1); see also Pub. Resources Code, § 21158, subds. (a), (d).) In addition, a focused EIR "shall analyze any significant environmental effects when:

(A) Substantial new or additional information shows that the adverse environmental effect may be more significant than was described in the Master EIR; or

(B) Substantial new or additional information shows that mitigation measures or alternatives which were previously determined to be infeasible are feasible and will avoid or reduce the significant effects of the subsequent project to a level of insignificance."

(CEQA Guidelines, § 15178, subd. (c)(4); see also Pub. Resources Code, § 21158, subd. (c).)

"A focused EIR need not examine those effects which the lead agency, prior to public release of the focused EIR, finds, on the basis of the initial study, related documents, and commitments from the proponent of a subsequent project, have been mitigated in one of the following manners:

(A) Mitigated or avoided as a result of mitigation measures identified in the Master EIR which the lead agency will require as part of the approval of the subsequent project;

(B) Examined at a sufficient level of detail in the Master EIR to enable those significant effects to be mitigated or avoided by specific revisions to the project, the imposition of conditions of approval, or by other means in connection with approval of the subsequent project; or

(C) The mitigation or avoidance of which is the responsibility of and within the jurisdiction of another public agency and is, or can and should be, undertaken by that agency."

(CEQA Guidelines, § 15178, subd. (c)(2) (emphasis added); see also Pub. Resources Code, § 21158, subd. (b); see also Pub. Resources Code, § 21081.)

When an agency finds that an focused EIR need not examine certain effects because they have already been mitigated, that finding "shall be included in the focused EIR prior to public release' of the document for formal public review. (CEQA Guidelines, § 15178, subd. (c)(3).)

After approving a "subsequent project" for which a focused EIR has been prepared, a lead agency must file a notice of determination pursuant to CEQA Guidelines section 15094. (CEQA Guidelines, § 15178, subd. (d).)

1.5.1.4. Intended Use of This MEIR in Relation to Proposed Management Strategies

Intended uses of the MEIR in relation to each of the management strategies evaluated are described below.

No Project – Continuation of Existing Policy

As explained above, this MEIR is intended to help streamline the CEQA process by evaluating impacts of subsequent shoreline and coastal bluff protection devices under the No-Project (Existing Policy) to the greatest extent feasible, and by proposing mitigation measures that could reduce the impacts of such devices. Such impacts include cumulative, growth-inducing, and irreversible significant environmental effects. Subsequent shoreline and coastal bluff protection device projects that are found to be within the scope of this MEIR may require no further CEQA review. Subsequent shoreline and coastal bluff protection device projects that are not found to be within the scope of, but have been identified in, this MEIR may require either a Mitigated Negative Declaration (MND) or a Focused Environmental Impact Report (EIR) for the subsequent project. (CEQA Guidelines, § 15178.) Subsequent shoreline and coastal bluff protection device projects also may be subject to the five-year limitation set forth in Public Resources Code section 21157.6, which states that "*the MEIR cannot be used to limit subsequent project reviews if it was certified more than five years before the application for a subsequent project was filed*." However, the MEIR can be used to limit environmental review for subsequent projects if findings can be made that "*no substantial changes have occurred with respect to the circumstances under which the MEIR was certified or that no new information, which was not known and could not have been known at the time that the MEIR was certified as complete, has become available*."

For reasons discussed earlier, no additional EIRs will be required for subsequent projects if the City of Solana Beach:

- Incorporates in the project all feasible mitigation measures or alternatives as set forth in the MEIR.

- Prepares an Initial Study that concludes:
  - The proposed project was described in the MEIR.
  - No additional significant impact would occur.

- Prepares findings that:
  - The Project is within scope of MEIR.
  - No additional significant impact would occur.
  - No new additional mitigation or alternatives would be required.

- Prepares public notice pursuant to CEQA Guidelines § 15075.

Repeal of Shoreline and Coastal Bluff Protection Ordinance

The Repeal of Shoreline and Coastal Bluff Protection Ordinance alternative was also included within the scope of this MEIR and analyzed pursuant to CEQA MEIR requirements to the extent feasible. Subsequent projects under this alternative would be the responsibility of the California Coastal Commission and may require additional CEQA review.

Sand Replenishment and Retention Program

The Sand Replenishment and Retention Program alternative was also included within the scope of this MEIR and analyzed per CEQA MEIR requirements to the extent feasible. Subsequent projects under the San Replenishment and Retention Program may require a focused EIR or a MND as mentioned above, and similar findings would need to be made. It is possible, however, that full-blown individual EIRs might be required instead, given the scale of the offshore structures that might be constructed, and the biological resource impacts that might occur. For the sake of efficiency, any such EIR could be combined with a federal environmental document prepared pursuant to the National Environmental Policy Act ("NEPA") (42 U.S.C. § 4321 et seq.) to satisfy federal agency approvals required in connection with such structures.

Planned Coastal Retreat Policy

Under the Planned Coastal Retreat Policy, subsequent projects undertaken within the next five years would likely be found to come within the scope of this MEIR, although changing conditions in the future will almost certainly require an update to this MEIR or new site-specific environmental documents at some time during the succeeding period. Because subsequent projects would require the purchase of the land and/or properties seaward of the planned retreat lines through the purchase or eminent domain over a 50- year and 100- year period, as the property became increasingly dangerous to inhabit, the City and Coastal Commission might find themselves occasionally facing "emergency" situations that can be addressed without CEQA compliance. (Pub. Resources Code, § 21080, subd. (b)(4); CEQA Guidelines, § 15269, subd. (c).). No direct physical change in the environment would result as a result of this policy because the policy would not result in any change to the existing natural shoreline and coastal processes. However, adoption of this policy would require a change in state law as described in detail in § 2.4.1.

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2.0 PROJECT DESCRIPTION

The four alternatives considered in this MEIR reflect issues of concern based on public input from the community members of the City of Solana Beach. Scoping comments were gathered from interest groups including community members, organizations, and government regulatory agencies, which were utilized to establish appropriate alternatives for this MEIR. A public scoping meeting held on April 10, 2001, at the City of Solana Beach solicited concerns and issues associated with this MEIR. All comments were considered to help provide further guidance for establishing the alternatives (Appendix C.1). Issues pertaining to several previous studies and available data on impacts of shoreline protection were also utilized as criteria for selecting the Project alternatives.

2.1 No Project Alternative – Continuation of Existing Policy

2.1.1 Characteristics

The applicable definition of the no project alternative for the purpose of this MEIR under CEQA is the continuation of the existing policy (Guidelines Sec. 15126.6 (e) (3)). Under this alternative the existing Shoreline and Coastal Bluff Protection Ordinance, enacted on May 16, 1994, would remain the policy for issuing special use permits for shoreline protection devices along the Solana Beach coastline as described in Appendix A. Its purpose, as stated within the ordinance, is to create a regulatory framework that balances the protection of vested private property rights and important public interests in shoreline resources that can be harmed by the construction of coastal bluff protection measures. Continuation of this policy in the long term will likely result in armoring the entire natural coastal bluff with shoreline protection structures in Solana Beach, though such structures may include a greater percentage of notch fills and seacave fills, compared with larger seawall structures, than would occur should the Ordinance be repealed and the approval of protective structures were left to the discretion of the California Coastal Commission acting pursuant to Public Resources Code section 30235. Figures 2-1 through 2-7 depict locations of existing seawalls, seacaves, and notch fills. Areas not currently protected as depicted on these figures would be subject to future bluff protection structures.

A summary of the policies of the existing Shoreline and Coastal Bluff Protection Ordinance are as follows (Solana Beach Municipal Code [SBMC] Chapter 17.62.020).

A. … it is the policy of the city council of the city of Solana Beach to strictly regulate the construction of new seawalls, revetments, bluff retaining walls, gunite covering, metal or wood armoring and other similar shoreline defense structures. Such protection measures generally will not be allowed when other feasible shoreline or coastal bluff protection measures are available. Permits for the construction of seawalls, revetments, bluff retaining walls, gunite coverings, metal or wood armoring and other similar structures will be issued only when necessary to accomplish one of the following purposes:

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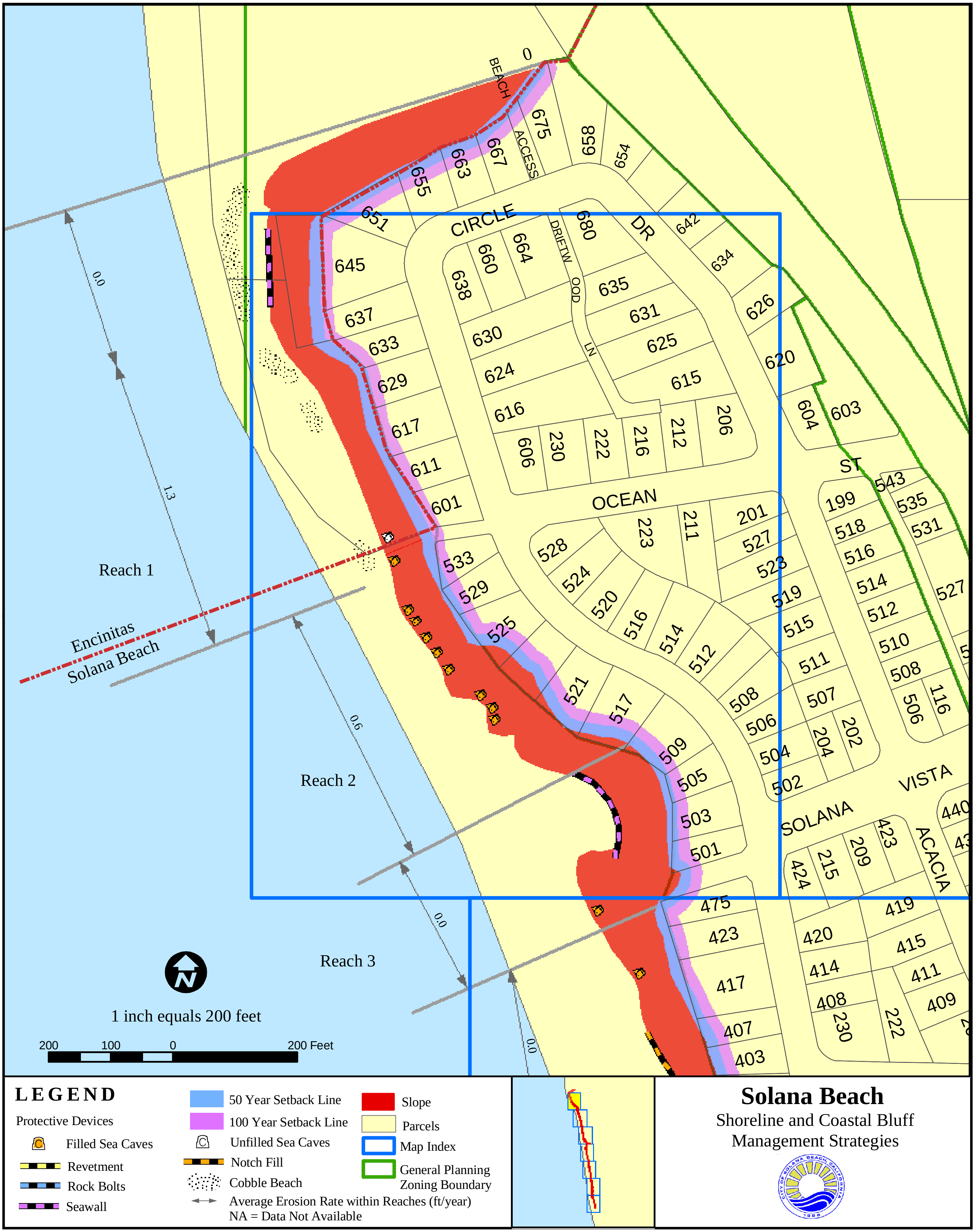

Source: City of Solana Beach GIS Database

Existing Shoreline Protection and Estimated Setback Lines as of 1997

FIGURE
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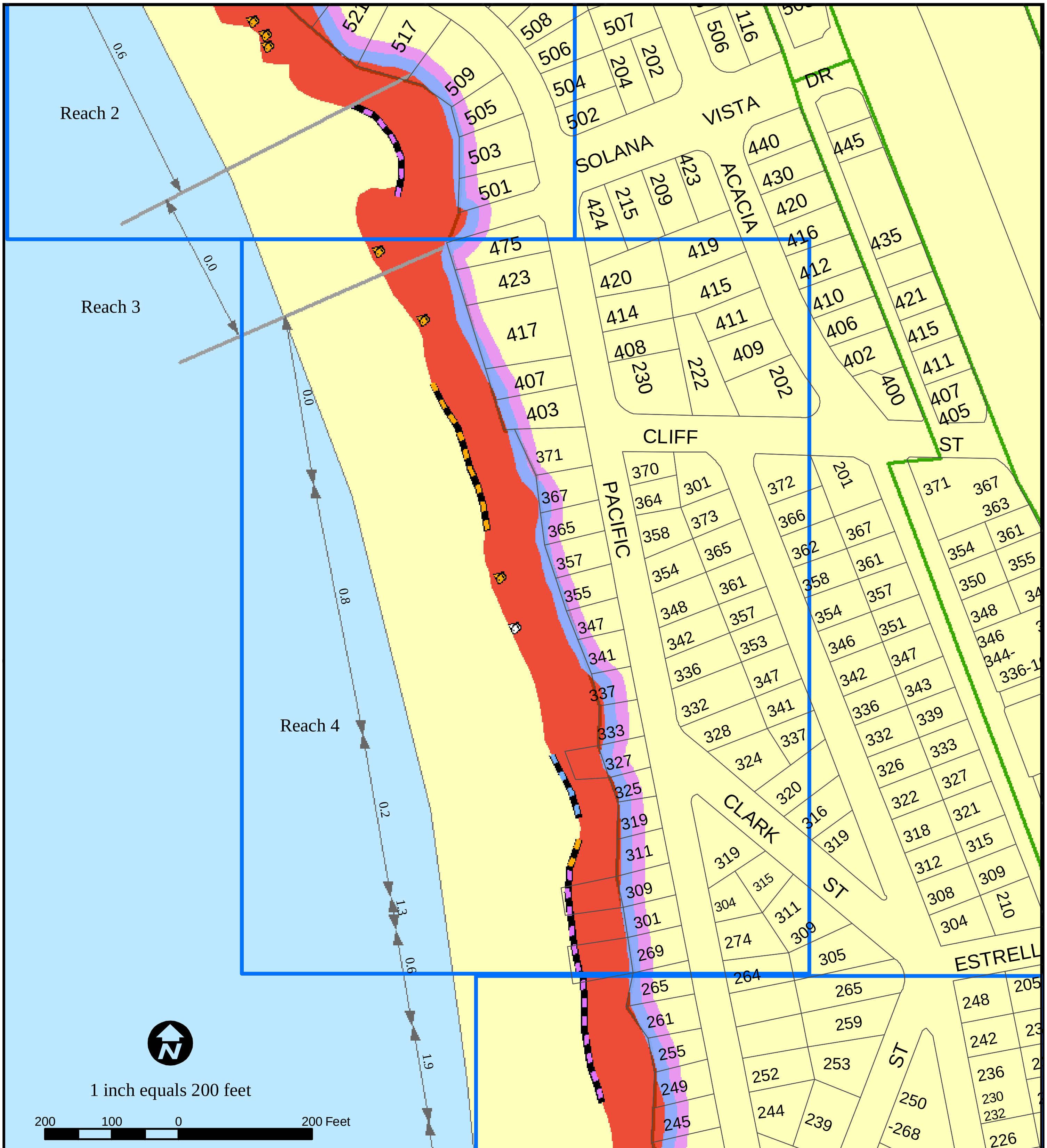
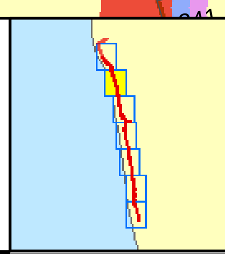


LEGEND

Protective Devices

- Filled Sea Caves
- Revetment
- Rock Bolts
- Seawall
- 50 Year Setback Line
- 100 Year Setback Line
- Unfilled Sea Caves
- Notch Fill
- Cobble Beach
- Average Erosion Rate within Reaches (ft/year)
  NA = Data Not Available
- Slope
- Parcels
- Map Index
- General Planning Zoning Boundary



Solana Beach

Shoreline and Coastal Bluff Management Strategies

Source: City of Solana Beach GIS Database

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Existing Shoreline Protection and Estimated Setback Lines as of 1997

FIGURE **2-2**

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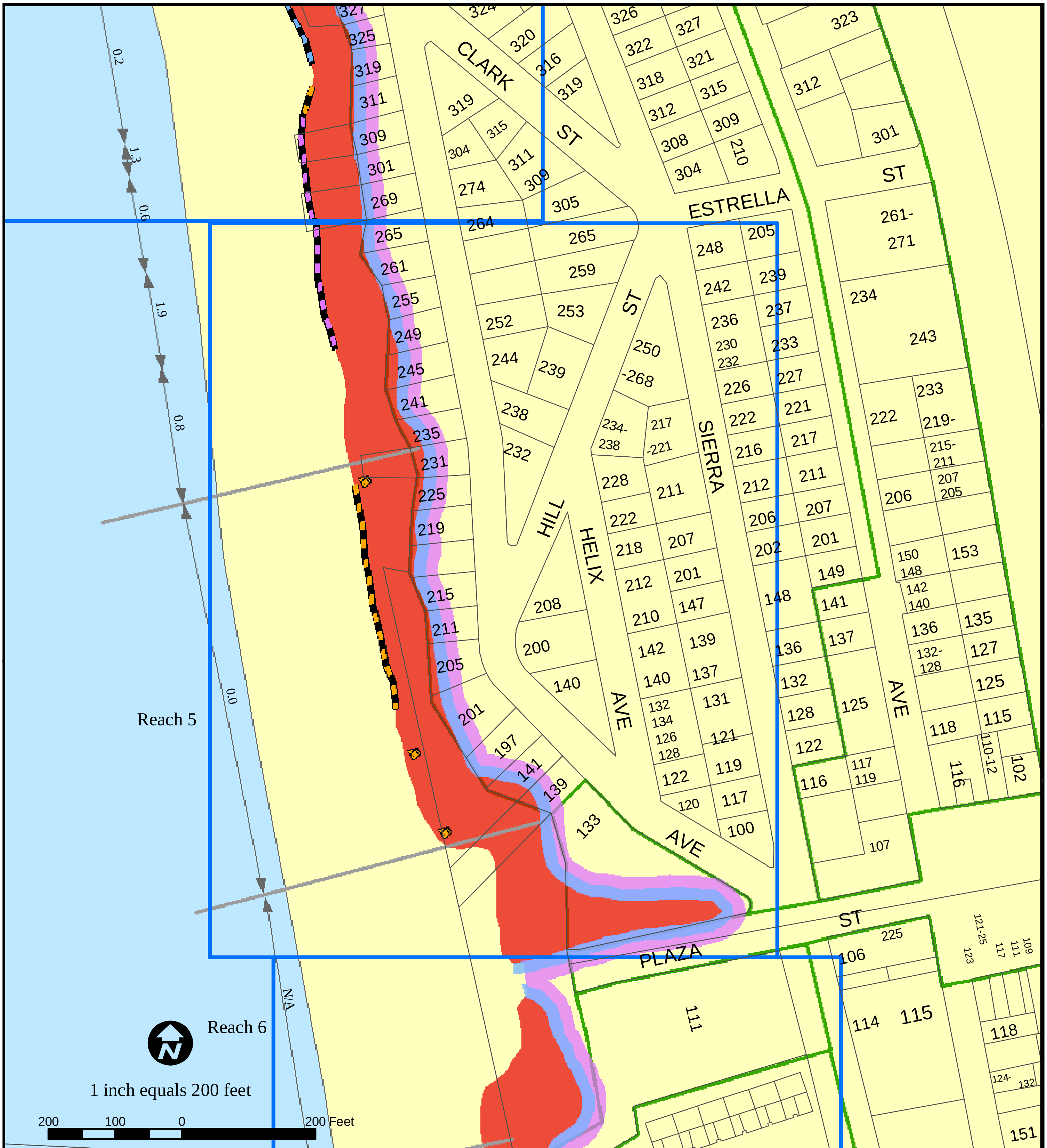
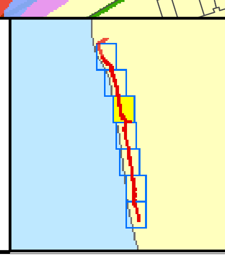


LEGEND

Protective Devices

- Filled Sea Caves
- Revetment
- Rock Bolts
- Seawall
- 50 Year Setback Line
- 100 Year Setback Line
- Unfilled Sea Caves
- Notch Fill
- Cobble Beach
- Average Erosion Rate within Reaches (ft/year)
  NA = Data Not Available
- Slope
- Parcels
- Map Index
- General Planning Zoning Boundary



Solana Beach
Shoreline and Coastal Bluff
Management Strategies

Source: City of Solana Beach GIS Database

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Existing Shoreline Protection and Estimated Setback Lines as of 1997

FIGURE
2-3

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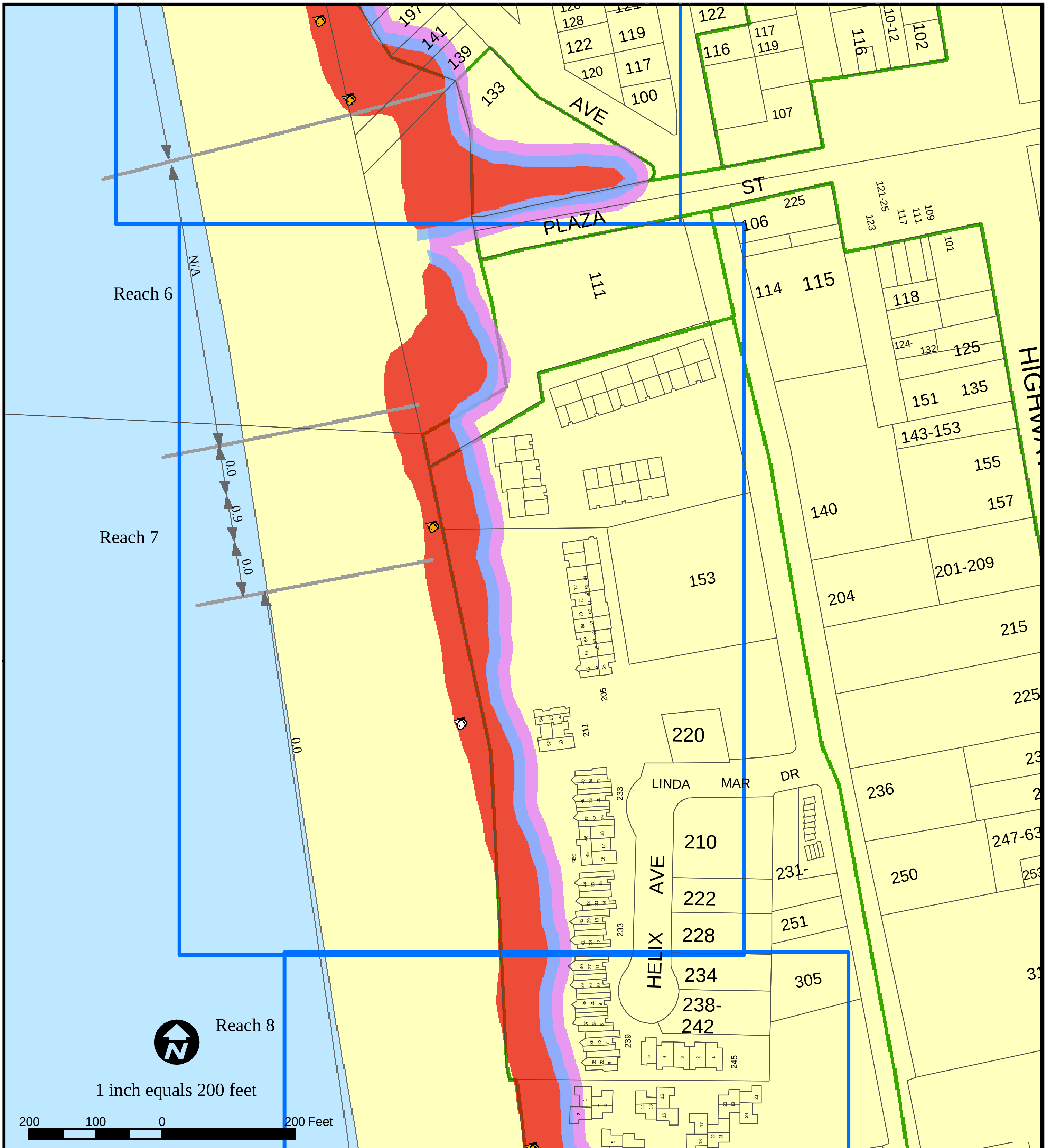

LEGEND

Protective Devices

- Filled Sea Caves
- Revetment
- Rock Bolts
- Seawall
- 50 Year Setback Line
- 100 Year Setback Line
- Unfilled Sea Caves
- Notch Fill
- Cobble Beach
- Average Erosion Rate within Reaches (ft/year)
  NA = Data Not Available
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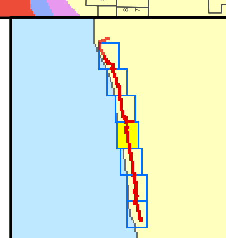

Solana Beach
Shoreline and Coastal Bluff Management Strategies

Source: City of Solana Beach GIS Database

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Existing Shoreline Protection and Estimated Setback Lines as of 1997

FIGURE **2-4**

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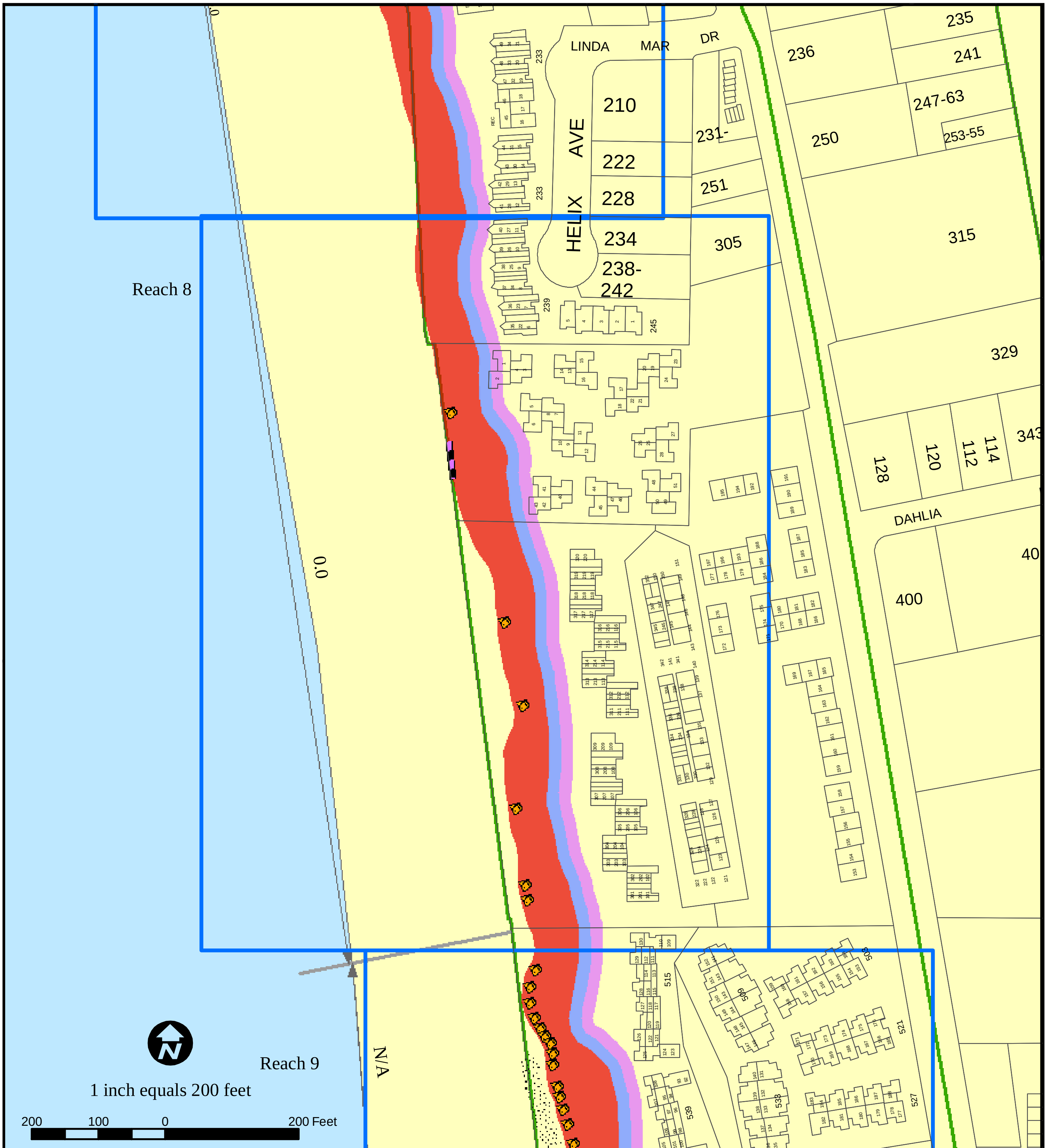

LEGEND

Protective Devices

- Filled Sea Caves
- Revetment
- Rock Bolts
- Seawall
- 50 Year Setback Line
- 100 Year Setback Line
- Unfilled Sea Caves
- Notch Fill
- Cobble Beach
- Average Erosion Rate within Reaches (ft/year)
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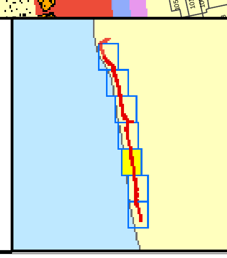

Solana Beach

Shoreline and Coastal Bluff Management Strategies

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Existing Shoreline Protection and Estimated Setback Lines as of 1997

FIGURE **2-5**

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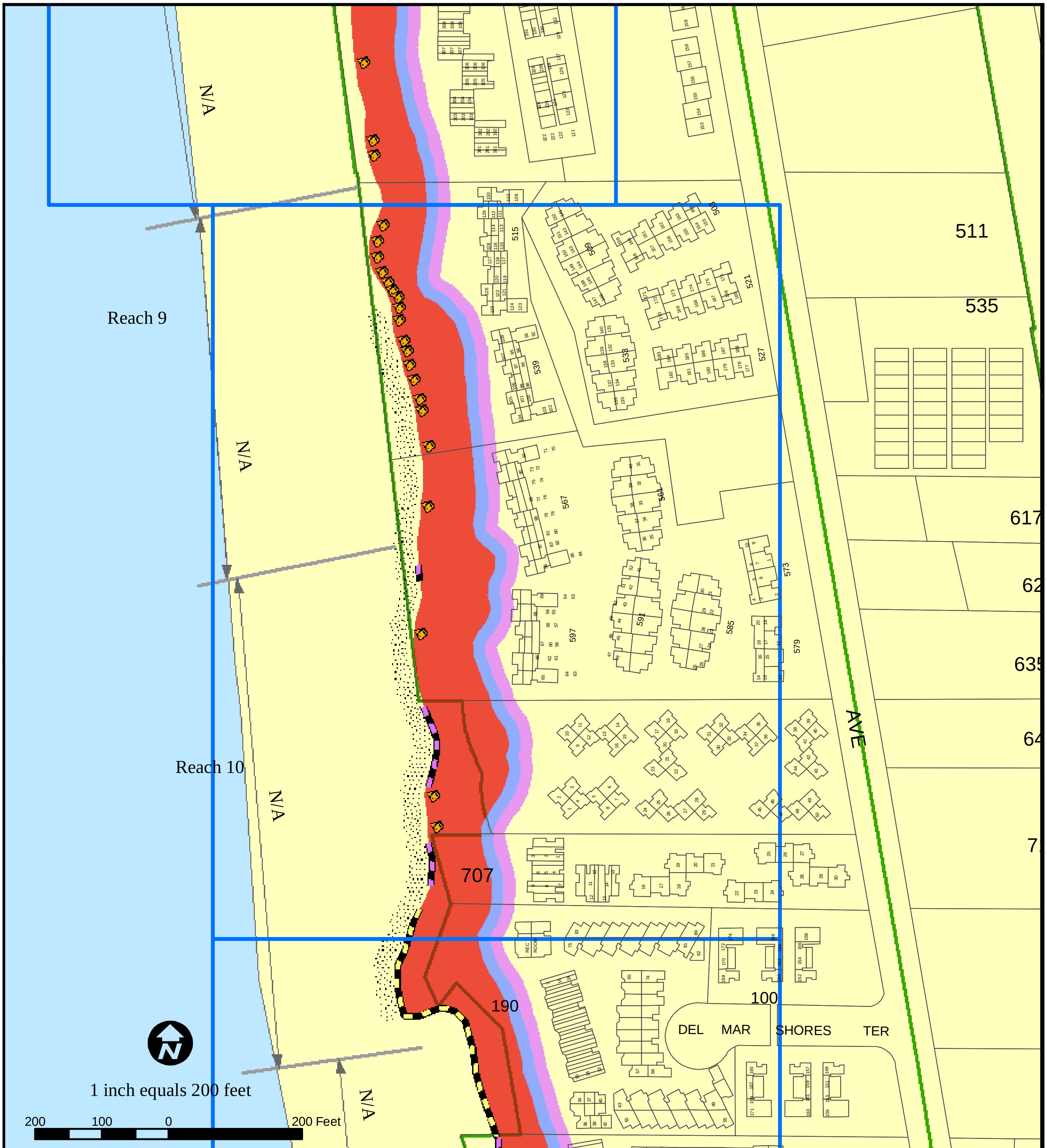

LEGEND

Protective Devices

- Filled Sea Caves
- Revetment
- Rock Bolts
- Seawall
- 50 Year Setback Line
- 100 Year Setback Line
- Unfilled Sea Caves
- Notch Fill
- Cobble Beach
- Average Erosion Rate within Reaches (ft/year)
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- Parcels
- Map Index
- General Planning Zoning Boundary

Solana Beach

Shoreline and Coastal Bluff Management Strategies

Source: City of Solana Beach GIS Database

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Existing Shoreline Protection and Estimated Setback Lines as of 1997

FIGURE **2-6**

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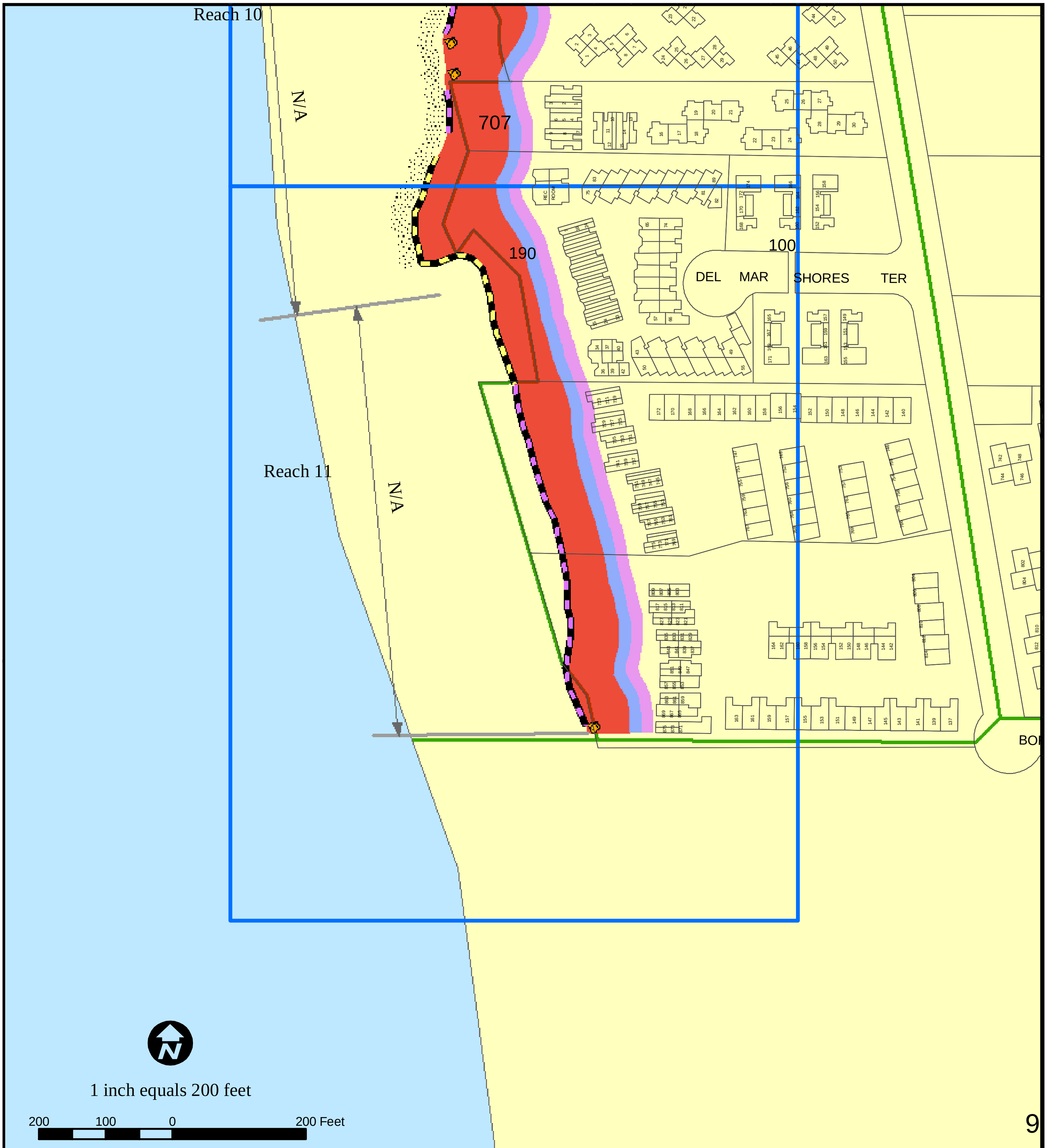

LEGEND

Protective Devices

- Filled Sea Caves
- Revetment
- Rock Bolts
- Seawall
- 50 Year Setback Line
- 100 Year Setback Line
- Unfilled Sea Caves
- Notch Fill
- Cobble Beach
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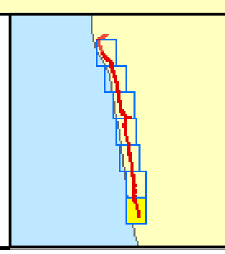

Solana Beach
Shoreline and Coastal Bluff Management Strategies

Source: City of Solana Beach GIS Database

amec

Existing Shoreline Protection and Estimated Setback Lines as of 1997

FIGURE **2-7**

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1. To protect existing legally built structures on property when the structure or structures are threatened with imminent danger or destruction from bluff failure due to erosion and other methods of protecting the structure or structures are not feasible, and the benefit of protecting the structure as opposed to removing it outweighs the adverse impact resulting from the construction of the protective device; or

2. To preserve economically viable use of property, when it is demonstrated that without the proposed protection measure the property could not be used for any economically viable purpose and other methods of protecting or economic usefulness of the property are feasible; or

3. To abate a public nuisance when other methods of abatement including, but not limited to, removal of a structure or improvement would result in a severe economic hardship to the owner of private property or the loss of a significant public benefit.

B. Shoreline protection measures such as seacave plugging and filling are preferred over the construction of seawalls, bluff retaining walls, gunite covering and similar permanent armoring. Permits for seacave plugging and filling will be expeditiously processed and will generally be permitted or conditionally permitted to be constructed in accordance with the design criteria of this chapter. Plugging and filling of caves is acceptable as a reasonable measure to prevent erosion and minimize effects that could result in a future need to construct a more intrusive protection device.

C. Riprap, sand bags, armoring, revetments and other temporary bluff protection measures shall be permitted only on a temporary basis to respond to an emergency.

D. It is the further policy of the city that applications for permits under this chapter be processed expeditiously to the extent such processing is consistent with the protection of the public interest and the preservation of private property.

Select portions of the ordinance that specify why a shoreline defense structure would be permitted by the city and measures and restrictions that apply to the construction of such structures are presented below. The complete ordinance is provided in Appendix A. The ordinance states (Chapter 17.62.080) that the only time a special use permit will be granted by the City Council is if the following situations are applicable:

1. a. An existing significant structure is threatened with imminent danger or because of bluff erosion which occurs naturally, or which results or arises from circumstances which are not within the control of the property owner, and is reasonably foreseeable that without the shoreline defense structure the threatened structure on the site will suffer structural damage; or

   b. The shoreline defense structure is necessary to abate a public nuisance existing on the property that cannot be reasonably abated in another manner; or

c. Unless the shoreline defense structure is permitted the property will be used for any economically viable use permitted by the city's general plan and applicable zoning.

2. No other reasonably feasible method of stabilizing the coastal bluff will protect the existing structure, abate the nuisance or preserve the economically viable use of the property.

3. The property owner has taken reasonable steps to protect the property and significant structures by other means.

4. The owner or prior owners did not create the necessity for the shoreline defense structure by unreasonably failing to implement generally accepted erosion and drainage control measures or by otherwise unreasonably acting or failing to act with respect to the property.

5. The location, size, design and operation characteristics of the proposed shoreline defense structure will not adversely affect adjacent public or private property, natural resources, or public use of the beach.

6. The proposed shoreline defense structure will be:

   a. The minimum measure necessary to provide a reasonable level of protection; and

   b. Constructed and maintained to incorporate an earth-like appearance which will resemble as closely as possible the natural color and texture of the adjacent bluffs; and

   c. Constructed and maintained to reasonably conform to the natural form of the bluff; and

   d. Placed at the most feasible landward location; and

   e. Appropriately landscaped and maintained to blend in with the existing environment.

7. The shoreline defense structure will be located entirely on private property or, if the structure will be located partially or entirely on public property or property subject to a public trust all required permits for construction or real property interests have been obtained, or will be obtained, from the appropriate public agency or agencies with jurisdiction and/or ownership.

8. The construction of the structure and reconstruction of the bluff face, if any, will not result in a usable area at the top of the bluff larger than existed on January 3, 1991 or extend the bluff top edge seaward more than 10 feet from the bluff top edge as it existed on January 3, 1991 as shown on the orthophoto map of the city dated January 3, 1991 and on file in the planning department.

9. The project as approved or conditionally approved will not adversely affect the public health, safety or welfare and will not unreasonably affect the public use of the beach. Encroachments into the public beach shall be mitigated to the satisfaction of the city council.

B. A special use permit for any other erosion control measure, bluff repair or work on the coastal bluff not otherwise addressed in subsection A of this section, or in SBMC 17.62.100 shall be denied unless the city council finds that the measure is:

    1. A necessary preventative measure to stop or control erosion of the bluff; and

    2. The measure will not adversely affect the bluff.

In addition, Chapters 17.62.140 and 17.62.160 of the Solana Beach Municipal Code discuss the maintenance and repair of defense structures and measures and restrictions for landscaping, irrigation, and drainage on the bluff tops, respectively.

As the preceding discussion demonstrates, the City's Shoreline and Coastal Bluff Protection Ordinance embodies a comprehensive strategy for limiting the circumstances in which shoreline protective devices may be constructed, and for ensuring the minimization of the environmental impacts such structures may create. The Ordinance creates what the City considers to be a proactive approach intended to minimize the circumstances in which large intrusive seawalls are necessary. Such a goal can be accomplished by allowing – upon the receipt of permit applications – construction of small, nonintrusive structures (e.g., notch fills) as a means of halting erosion before it becomes so pronounced that larger structures are necessary to protect property owners' rights under the Coastal Act. (See Pub. Resources Code, § 30235.)

Notably, an approval from the City by no means alters or eliminates a property owner's need to obtain various additional permit approvals from other public agencies. Such entities include the California Coastal Commission, and may include the California State Lands Commission and the United States Army Corps of Engineers.

2.1.2 Intensity

Under the City's existing Ordinance special use permits for shoreline protection devices along the Solana Beach coastline would continue. These devices include: various types of seawalls, revetments, shotcrete walls/cave or notch infills, and cobble berms. Approximately 20 percent of the Solana Beach coastline is armored with seawalls. The percentage of the Solana Beach coastline with some type of protection increases to about 45 percent, when including concrete installed on the coast to infill notches and seacaves, rip rap revetment (not in areas of other types of protective devices) as well as rock bolts installed to stabilize the lower bluff.

Cantilever Seawalls

Cantilever seawalls are typically constructed to protect the bluffs from wave-energy erosion caused by sand and cobble thrown against the toes of the cliffs. Seawalls stop soil erosion from reaching the beach and can cause the potential loss of beach width in areas where the bluff face is highly erodible. Typical seawalls consist of 24-inch square pre-stressed concrete piles approximately 45 feet long set and grouted into pre-drilled holes with a height 15 feet above Mean Lower Low Water (MLLW). Precast wall panels, set behind the row of piles and grout fill, complete the structure. Depending upon the specific site location, seawalls could vary from 2 to 2.5 feet in thickness, 15 to 40 feet high, and 20 to 600 feet in length. Notches in the bluffs would be filled with grout behind the wall panels (AMEC 2001).

These structures are designed in areas where it is necessary to protect land areas from erosion of other damage due to wave action. These structures need moderate to good beach access to be effectively constructed. These structures, if properly designed, are considered to be effective for periods of 50 to 200+ years.

Shotcrete Walls

Shotcrete walls consist of 6-inch thick reinforced walls, applied directly onto the bluff face, up to an elevation of 15 feet or higher above MLLW. The design enables a relatively low-cost plan to armor the seacliff toe, effectively filling in seacaves or notch areas to achieve an overall result of improving seacliff stability, and arrest further erosion of the bluff base. These areas would be filled with concrete that has erosion characteristics similar to the adjacent bluff material. These types of walls are least dependent on construction access as compared to cantilever seawalls. Depending upon specific site location, shotcrete walls could vary from 15 to 40 feet high and 20 to 600 feet in length (AMEC 2001). These structures typically have a design life from 10 to 30 years, depending on the specific aspects of the design and the site-specific constraints (steepness of the slope face, etc.)

Upper Bluff Tieback Walls

Upper bluff tieback walls are designed to reduce the blufftop recession process in areas where there is significant upper and mid bluff erosion or the existing structure is threatened. A typical wall would consist of a tied-back, free form structural shotcrete skin that can be carved and colored to increase its natural appearance. The tie-back anchor is a steel rod (encased in concrete into a hole) drilled back into the existing face of slope for a distance of 20 to 80 feet. The structural face would likely be 15 to 18 inches thick, and be constructed on a 1:4 (horizontal:vertical) slope extending down from the existing top of bluff. Depending upon specific site location, tieback walls could range from 30 to 90 feet in height and 20 to hundreds of feet in length (AMEC 2001). The typical design life of these structures is 20 to 50+ years.

Plugs/Fills

Plugs and fills consist of filling existing seacave notches with textured and colored, erodible or non-erodible concrete to blend into the existing bluff face and designed to reduce erosion, further deepening of existing seacaves, and minimizing the effects that could result in a future need of a more intrusive protection device. Erodible plugs and fills in the short-term keep seawalls from being built. Short-term is defined as 5 to 30+ years (in areas of faster bluff and sub-aerial erosion where structures are built close to the top of the bluff) or 50 to 100 + years (in areas where there is less erosion and there is adequate setback from the top of the bluff). Non-erodible plugs and fills, in the short-term will do the same. In the long-term, both erodible and non-erodible plugs and fills will result in the ultimate landward erosion of the bluffs. Wire mesh or riprap is used with the concrete mixture. Depending upon specific site location, seacave notches can range from 5 to 400 feet in width, 5 to 20 feet in height, and 2 to 40 feet in depth.

Revetments

Revetments are flexible structures made of placed quarry stone designed to protect bluff toes from erosion by wave action. The revetment structure is designed for depth limited wave conditions at various cross-section locations. The design feature has a crest elevation at over 15 feet above MLLW with a slope face inclination of 1.5:1 (horizontal:vertical) at a depth of about 15 feet from the bluff face. Notches in the bluffs are filled with grout behind the revetments. Revetments for the wave conditions in the Solana Beach area are anticipated to have a heavy woven filter fabric below 4 to 7 ton armor stone. Depending upon the specific site location of revetments, lengths of revetments could range from 5 feet to hundreds of feet (AMEC 2001). The typical design life for revetments is 20 to 50+ years (with maintenance) depending on the intensity of storms.

Cobble Berms

A cobble berm is a non-conventional approach to readdress the seacliff erosion problem. The design would entail import and placement of large quantities of cobble (on the order of 2 to 10 inches in maximum dimension such as currently exists along the northern and southern portions of Solana Beach and at the base of certain seawalls) to form a berm at the seacliff toe. The concept is an attempt to simulate what naturally occurs in the cobble beach in Solana Beach. The cobble berm would be designed to have a crest elevation at over 15 feet, MLLW, a crest width of 20 to 80 feet and a fronting face slope of 2:1 to 4:1 (horizontal:vertical). Although the stability and transport dynamics of cobble are not well known, it appears that groin-like structures help to preserve accumulations of the material in much the same way that conventional groins do with sand. Depending upon the specific site location of these berms, lengths of cobble berms could range up to hundreds of feet (AMEC 2001). These features may be typically used in more environmentally sensitive areas where seawalls or other protective devices may not be feasible. Typical design life is on the order of 5 to 20 years and may or may not be used in conjunction with other stabilizing devices.

2.1.3 Location

As mentioned above, approximately 45 percent of the Solana Beach's coastline has various types of shoreline and bluff protection devices in place. It would be too speculative to describe site-specific locations for the construction of future shoreline protection devices and which specific device would be constructed due to the unpredictability of wave and tide conditions, beach width, and cliff strength (Flick 2001). Site observations indicate that there are currently three unfilled seacaves along Solana Beach's shoreline that could be filled consistent with the City's existing ordinance, which promotes the construction of seacave plugs and fills over seawalls (Figures 2-1, 2-2, and 2-4).

2.1.4 Implementation

The costs to implement various shoreline and bluff protection devices in order to protect private property would be the responsibility of the private property owner. Private property owners would be responsible for all design studies, construction, and maintenance costs of the devices. A permit is required by the City's ordinance for the construction of all shoreline and bluff protection devices. Shoreline and bluff protection devices constructed to protect any public lands would be the responsibility of the City of Solana Beach through its capital improvements budget. Estimated costs for various shoreline and bluff protection devices are shown in Table 2-1 below.

Table 2-1
Estimated Construction and Maintenance Costs for Shoreline and Bluff Protection Devices

Shoreline and Bluff Protection Device	Estimated Construction Cost (per foot of length)	Estimated 10-Year Maintenance Cost (per foot of length)
Cantilever seawalls[1]	$1,500	$50-$100
Shotcrete walls[2]	$600	$30-$50
Bluff tie-back retaining walls	$2,500-$3,000	$30-$50
Plugs and fills	$600	$30-$50
Revetments[3]	$1,500	$20
Cobble berms[4]	$1,000	$200

Source: AMEC 2001.

Notes:
[1]Assumes a 45-foot-long pier length.
[2]Assumes a wall height to elevation 15 feet MLLW.
[3]Assumes a 15-foot-wide revetment with a 1.5:1 slope face, top elevation at 15 feet MLLW.
[4]Assumes a 20-foot-wide berm with top elevation of 15 feet MLLW.

2.2 Repeal of the Shoreline and Coastal Bluff Protection Ordinance Alternative

2.2.1 Characteristics

This alternative would relinquish sole responsibility and approval of all shoreline protection devices to the California Coastal Commission, which was the original permit authority and is still the final authority for such protection devices. The California Coastal Act requires the California Coastal Commission to issue “coastal development permits” (CDPs) for construction of shoreline protection structures necessary “to protect existing structures” that are “in danger from erosion,” provided that the proposed protective structure will be “designed to eliminate or mitigate adverse impacts on local shoreline sand supply.” (Pub. Resources Code, § 30235.) . Since the adoption of the Shoreline and Coastal Bluff Protection Ordinance in 1994, the City has added its own more proactive permit requirement to supplement the regulatory scheme put in place by the Coastal Act. However, as noted earlier, approval of a project by the City is not enough to allow a property owner to build a structure in the absence of a parallel and complementary approval from the California Coastal Commission. Therefore, under this alternative in which the City’s existing shoreline and coastal bluff protection ordinance is repealed, approval of shoreline protection would proceed directly to the California Coastal Commission, without the review and authority of the City. From a practical standpoint, the California Coastal Commission essentially cannot deny shoreline protection permits for the protection of public and private properties when the proposed design will mitigate impact to the shoreline sand supply (which, to date, has been satisfied through the imposition of a “sand mitigation fee” by the Coastal Commission). This alternative, in the long term, will likely result in armoring the entire natural coastal bluff with shoreline protection structures in Solana Beach, even if there is no policy at the City level to prevent construction of shoreline structures. Notably, however, the past practices of the Coastal Commission, particularly in the nearby City of Encinitas, strongly suggest that the Coastal Commission is less likely to implement a proactive approach favoring notch fills and seacave fills than would occur under the No Project Alternative, but instead is likely to take action only when erosive conditions have become so severe that large, intrusive seawalls are the only viable means of adequately protecting bluff-top properties. See Figures 2-1 through 2-7 for the location of areas potentially subject to bluff protection structures.

2.2.2 Intensity

Under the repeal of the City’s Ordinance, coastal development permits for shoreline protection devices along the Solana Beach coastline would continue to be required; however the City of Solana would relinquish its current responsibility under the Ordinance and would leave the sole responsibility and approval for all shoreline protection devices to the California Coastal Commission. These devices include: various types of seawalls, revetments, shotcrete walls/cave or notch infills, and cobble berms. Because the California Coastal Commission, under specified circumstances, cannot deny shoreline protection permits for the protection of public and private properties, the armoring of the entire natural coastal bluff, especially with seawalls, has a higher probability of occurring than would occur if the City’s Ordinance were left in effect.

2.2.3 Location

As mentioned previously, approximately 45 percent of the Solana Beach's coastline has various types of shoreline and bluff protection devices in place. It would be too speculative to describe site-specific locations for the construction of future shoreline protection devices and which specific device would be constructed due to the unpredictability of wave and tide conditions, beach width, and cliff strength (Flick 2001). Site observations indicate that there are currently three unfilled seacaves along Solana Beach's shoreline that could be filled (Figures 2-1, 2-2, and 2-4).

2.2.4 Implementation

Implementation costs and funding options for the various types of shoreline and bluff protection devices under this alternative would be identical to those listed in Table 2-1.

2.3 Sand Replenishment and Retention Program Alternative

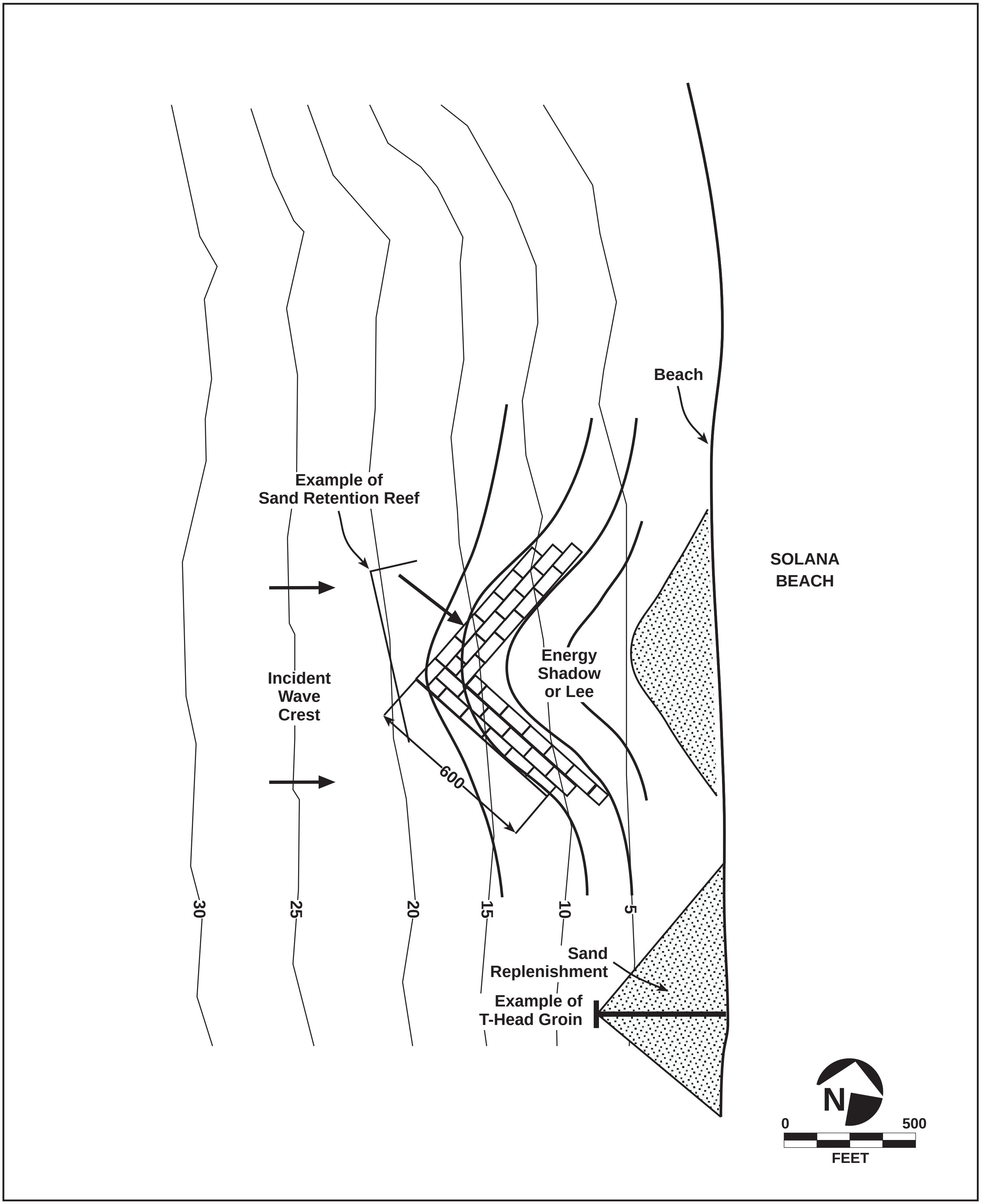
2.3.1 Characteristics

This alternative involves implementing a sand replenishment and retention program in Solana Beach. The San Diego Association of Governments (SANDAG) Beach Replenishment Project that was completed in the summer of 2001 and entailed placing 146,000 cubic yards of sand onto the beach at Fletcher Cove. This alternative used the SANDAG Beach Replenishment Project as a conceptual model on which to base the project intensity, location, and implementation costs of potential future subsequent sand replenishment projects. Processes may include dredging sand from offshore deposits and pumping the sand onshore, and importation of sand from other sources such as inland sources and then trucking the sand to the beach.

In addition, this alternative includes the possibility of developing sand retention structures that could include the construction of jetties, groins, artificial headlands, reefs, and other structures to keep sand resources in place. Figure 2-8 represents a conceptual example of sand retention structures.

Sand Replenishment

Sand replenishment is a "soft" protection device, which primarily utilizes dune or beach restoration or enhancement to prevent storm waves from reaching the backshore. Sand replenishment is contrasted with "hard" protection devices such as concrete and rock used in a variety of configurations to absorb or dissipate storm wave energy. Beaches can be restored or nourished to increase their width by depositing sand up coast, directly on beaches, or in the nearshore waters offshore of beaches. Benefits to sand replenishment and beach nourishment include the economic and aesthetic values of a wide recreation beach, the restoration of sandy



FIGURE

2-8

Sand Replenishment and Retention Example

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beach habitats, and increased public safety and access (The Resources Agency of California 2001).

Beach replenishment at Solana Beach could consist of the placement of dredged sediment along approximately 1,800 feet (0.3 mile) of the beach starting just south of Fletcher Cove and extending southward as was done by SANDAG in 2001. Under this scenario, berm would be constructed at this location to an elevation of approximately 12 feet above MLLW. The berm would be flat and extend seaward approximately 100 feet. The beach would then slope seaward approximately 135 feet at a slope of 10:1. Sand would be dredged from a borrow site located offshore from Solana Beach and placed onshore as described above. Construction could take place seven days a week, 24 hours a day or could be restricted on construction times and days consistent with the City's local noise ordinance (SANDAG 2000b).

Sand Retention Structures

Sand retention structures such as offshore breakwaters, artificial sand retention reefs, and groin fields are discussed below. A comprehensive program for sand replenishment and retention would use a combination of replenishment and the construction of one category of offshore structures described below.

Offshore Breakwaters

Offshore breakwaters are established measures for artificial sand retention. They reduce wave heights and alter the wave direction in their lee (shelter from the wind and waves), allowing sand to build up in their wave shadow zone. Breakwaters reduce wave energy by direct blocking of wave energy and eliminate surfing areas. The best benefit-to-cost offshore breakwater structure would be designed to include the following (SANDAG 2001b):

- Length of 1,000 feet
- Distance offshore of 1,000 feet to maximize cost/benefits and minimize risk of tombolo formation[3]
- Maximum width (i.e., distance offshore) of salient[4] of 500 feet
- Total length of retained beach (alongshore dimension) of 3,000 feet
- Total retained beach area of 750,000 square feet (about 17 acres)
- Structure crest elevation of +6 feet MLLW (about 3 feet above mean sea level).

Artificial Sand Retention Reefs

Artificial reefs are three-dimensional features that reduce wave heights in the lee. Reefs reduce transmitted wave energy through breaking and dissipation and can enhance

[3] The build up of beach sand all the way out to the breakwater as a result of too large of a wave shadow zone.
[4] A buildup of sand behind a sand retention structure such as an offshore breakwater.

surfing opportunities. To effect wave dissipation, reefs are wide in the cross-section direction. Large and irregularly shaped reefs refract waves thereby altering their approach direction toward the shoreline. A shore-connected reef is recommended over an offshore or barrier type reef for the following reasons (SANDAG 2001b):

- Shore connected reefs reduce wave diffraction around the reef which can reduce salient size.
- Shore connected reefs force any water ponding to occur over the reef reducing the possibility of scouring currents in the lee.
- The volume of a reef constructed close to shore is less because of the shallower water, resulting in lower construction cost.
- Natural examples of shore-connected reefs in Southern California exist which can assist in development of design guidance.

A typical design, which would meet the above criteria, would include:

- Total reef plan area of 5 acres
- Retained beach salient area of 2 acres
- Reef alongshore length of 900 feet
- Reef width of 320 feet
- Offshore slope of 1:20 (vertical:horizontal) to enhance the surf break
- Shelf elevation ranges from –2 feet MLLW to +1 feet MLLW

Groin Field

Groins are long, narrow structures placed approximately perpendicular to the shoreline to build or widen a beach by trapping littoral drift. The widened beach can then serve recreational and shore protection functions. Groins are fundamentally different from breakwaters and artificial reefs in that they do not attempt to modify transmitted wave energy as a mechanism for reducing long shore sediment transport, but instead they directly block the currents that carry the suspended sediment along the coast. Groins and groin fields have been used successfully to retain sand throughout the world and are recognized coastal engineering structures.

A typical groin field design would include (SANDAG 2001b):

- Length of 930 feet
- Two groins spaced 1,500 feet apart
- Maximum fillet width of 280 feet
- Minimum beach width of 150 feet between groins
- Total retained beach area of 750,000 square feet (about 17 acres)
- Structure crest elevation of +14 feet MLLW at the beach berm, sloping down to +3 feet MLLW in the water

- Sand-filled geotextile bags or removable sheet-piles could be used for a temporary pilot structure or armor stone for a permanent structure. Armor stone is assumed for the cost analysis.

2.3.2 Intensity

The exact number of periodic beach fills over a 50-year or 100-year period is difficult to predict according to SANDAG. This is due to the limited data that exists on beachfill longevity, the stability of the fill affected by future wave climate can be highly variable, and the future frequency and volume of future regional beach fills is unclear (SANDAG 2001b). In June 2001, 146,000 cubic yards of sand was pumped onto the Fletcher Cove beach as part of a SANDAG regional sand replenishment project, which placed 1.8 million cubic yards on ten beaches in North County. Sand Replenishment structures such as breakwaters, reefs, and groins would typically be constructed once every 50 years.

2.3.3 Location

All of the possible future subsequent sand replenishment projects would probably be mobilized at Fletcher Cove (south end). Sand could then be distributed north and south depending on environmental constraints. Constraints to sand retention exist along the region's coast due to sensitive environmental resources and existing surfing locations. Solana Beach is moderately constrained throughout to highly constrained at Seaside and Tabletop Reefs with the exception of Fletcher Cove (south end), which is less constrained. Future sand replenishment projects would probably be located at Fletcher Cove. Solana Beach has identified a possible future reef at Fletcher Cove, either submerged or with an emergent component if made to look like a natural feature (SANDAG 2001b).

2.3.4 Implementation

Costs estimates for sand replenishment and sand retention structures represent present value costs, i.e. the amount of capital required today to both build a structure and maintain it periodically in the future, taking into account inflation, current interest rates, and construction cost escalation (not necessarily the same as the overall inflation rate). The project life for the cost analysis is assumed 50 years. Tables 2-2 and 2-3 provide a comparison of the present value cost for sand replenishment without sand retention structures and with sand retention structures respectively. Itemized cost elements include (SANDAG 2001b):

- Initial construction cost for the structures.
- Pre-filling the estimated retained beach volume with sand from outside the littoral zone as mitigation for impacts associated with sand impoundment behind the structure.
- Full mobilization costs were assumed for the beach pre-fill since it was not reasonable to assume that the construction would be concurrent with a regional beachfill project.
- Future maintenance of the structures.

- Allowance for future replenishment of the retained beach areas due to storms.
- Allowance for engineering, design, supervision and administration costs.
- Allowance for surfing impact mitigation cost (breakwater only), assumed to be construction of an artificial surf reef (without sand retention characteristics) in the vicinity.

Table 2-2
Cost of Sand Replenishment Strategy without Retention Structures

Cost of Sand Replenishment Strategy (in Millions of Year 2002 Dollars)			
Replenishment Only	**Cost for First 50-Years**	**Cost for Second 50-Years**	**100-Year Total**
Cost of Initial Replenishment[1]	$7.2	0	$7.2
Cost of Subsequent Replenishment[2]	$64.8	$72.0	$136.8
TOTAL	***$72.0***	***$72.0***	***$144.0***

[1]Assumes an initial construction cost of $8 per cubic yard for sand including 15% contingency, 8% engineering, design and permitting, and 10% construction engineering & management. Assumes a beach width of 200 feet and length of 1.5 miles (northern 0.2 miles of beach not included for environmental concerns). Subsequent replenishment assumed at 100% of initial replenishment cost every 5 years. Costs and frequency of replenishment are based on SANDAG's Regional Beach Sand Retention Strategy Report, October, 2001.

[2]Subsequent replenishments occur every 5 years.

Source: AMEC

Table 2-3
Cost of Sand Replenishment Strategy with Retention Structures
(in Millions of Year 2002 Dollars)

Replenishment with Various Retention Structure Options		Cost for First 50-Years	Cost for Second 50-Years	100-Year Total
Beach Replenishment[1]				
	Initial Replenishment	$7.2	0	$7.2
	Subsequent Replenishment	$14.4	$18.0	$32.4
	Subtotal	*$21.6*	*$18.0*	*$39.6*
Retention Structure Options:				
-Groin Field (6 Groins)[2]	Initial Construction	$11.4	$0.0	$11.4
	Maintenance	$2.3	$4.6	$6.9
	Subtotal	*$13.7*	*$4.6*	*$18.3*
-Breakwater[3]	Initial Construction	$13.4	$0.0	$13.4
	Maintenance	$2.7	$5.4	$8.1
	Subtotal	*$16.1*	*$5.4*	*$21.5*
-Reef Complex (6 Reefs)[4]	Initial Construction	$43.8	$0.0	$43.8
	Maintenance	$8.8	$17.5	$26.3
	Subtotal	*$52.6*	*$17.5*	*$70.1*
Beach Replenishment plus Groin Field		***$35.3***	***$22.6***	***$57.9***
Beach Replenishment plus Breakwater		***$37.7***	***$23.4***	***$61.1***
Beach Replenishment with Reef Complex		***$74.2***	***$35.5***	***$109.7***

Notes:
[1]Assumes an initial construction cost of $8 per cubic yard for sand including 15% contingency, 8% engineering, design and permitting, and 10% construction engineering management. Assumes a beach width of 200 feet and length of 1.5 miles (northern 0.2 miles of beach not included for environmental concerns). Subsequent replenishment with properly designed structures assumed at 50% initial replenishment cost every 10 years. Costs and frequency are based on SANDAG's Regional Beach Sand Retention Strategy Report, October, 2001.
[2]Assumes six groins at 930 feet in length and spaced 1,500 feet apart. Costs were based on present $ values as estimated in SANDAG's Regional Beach Sand Retention Strategy Report, October, 2001.
[3]Assumes each breakwater will measure 1,000 feet in length and retain 3,000 feet of beach area (alongshore dimension). Two breakwaters would be required to protect the Solana Beach shoreline (except for the northern 1000 feet due to environmental concerns). Costs were based on present values as estimated in SANDAG's Regional Beach Sand Retention Strategy Report, October 2001.
[4]Assumes 6 reefs, each measuring 900' in length along the Solana Beach shoreline (except for the northern 1000' due to environmental concerns). Costs were based on present values as estimated in SANDAG's Regional Beach Sand Replenishment Strategy Report, October 2001.
General: Maintenance costs for retention structures are in 2002 dollars estimated at 20% of the initial construction cost over a 25-yr period incurred at year 25, 50, & 75. Construction costs include 15% contingency, 8% engineering, design, & permitting, and 10% construction engineering and management.

Source: AMEC

California Coastal Commission Sand Mitigation Fee

The California Coastal Commission currently has a beach sand mitigation fee program in place which includes a methodology to quantify the total volume of sand required to replace the losses due to shoreline protection structures as a result of reduction in the material from the bluff, reduction in the nearshore area, and loss of the available beach area. The money from the mitigation fee program is to be used to implement projects that provide sand to the region's beaches. A memorandum of agreement developed with SANDAG allows the Shoreline Erosion Committee to implement those projects. As mentioned in Chapter 1.0, the cliffs in Solana Beach do not contribute a significant amount of sand to the beach. Even if seawalls and shoreline protection structures did not exist, Solana Beach would still experience a sand shortage and a net southward migration of sand.

Additional funding sources for sand replenishment and sand retention devices would be necessary. Funding for future sand replenishment projects and retention devices has not been identified to date. Funding for sand replenishment and sand replenishment structures could come from multiple sources including, but not limited to, city, state, federal, and private sources as follows:

- Local, State, and Federal Grants
- Local or State Tax Allocations for Sand Replenishment and Retention Structures
- California Coastal Commission Sand Mitigation Fees
- Establish a Fair-Share Beach and Shoreline Maintenance District in Solana Beach
- City of Solana Beach Capital Improvements Funds

The City of Solana Beach is currently pursuing Section 227 Program funding. The U.S. Army Engineer Research and Development Center is coordinating the National Shoreline Erosion Control Development and Demonstration Program. The Program was authorized under Section 227 of the Water Resources and Development Act of 1996 and funding was appropriated to initiate the program in fiscal year 2000. The focus of Section 227 is the demonstration of prototype-scale "innovative" or "non-traditional" methods of coastal shoreline erosion abatement. In addition, the Governor's 2002-2003 Budget includes $6.5 million in beach restoration funds.

2.4 Planned Coastal Retreat Policy Alternative

2.4.1 Characteristics

This alternative would evaluate the feasibility of implementing a planned coastal retreat policy within the City. Planned coastal retreat entails allowing the seacliffs to naturally erode from continued wave action, therefore allowing the landward boundary of the beach to occur naturally as well. For instance (see Figures 2-1 through 2-7), this policy would establish setback lines, including a "no new development" setback line that would be the estimated bluff retreat line in 50 years, plus a margin of error. A second setback line would be the estimated bluff retreat line in 100 years, plus a margin of error. No new development, including additions to existing structures, would be allowed beyond these setback lines during the 50- and 100-year periods.

This alternative would require the purchase of the land and/or properties seaward of the planned retreat lines through purchase or eminent domain over a 50- and 100-year period, respectively, as the property became increasingly dangerous to inhabit. Funding for the acquisition of the properties could come from multiple sources including, but not limited to, city, state, federal, and private sources.

2.4.1.1 Legal Background of Implementation of the Planned Retreat Alternative

In order to allow City decisionmakers and the public to properly evaluate the feasibility of the Planned Retreat Alternative, a summary of the existing legal framework regarding coastal development is provided below. Issues that arise in examining this alternative include the City's ability to implement such an alternative by itself in light of existing state law, and whether or not implementation of such a policy would result in a taking of private property requiring just compensation.

A. Limits on the City's Authority to Implement the Planned Retreat Alternative in the Absence of Changes to State Law

While the City has authority to amend those provisions of its General Plan and Municipal Code that address the construction of shoreline protection devices, the practical effect of any such changes must be assessed in light of how they would relate to provisions of the California Coastal Act (Pub. Resources Code, § 30000 et seq.) addressing the same subject matter.

Absent changes in state law, the City, by itself, cannot implement the Planned Retreat Alternative. Public Resources Code § 30235 allows a property owner, upon a proper showing, to obtain a permit for a shoreline protection device directly from the California Coastal Commission. Thus, even if the City repealed or modified its existing local scheme in favor of one that intended to implement a "planned retreat" strategy, state law as currently written would not permit the California Coastal Commission to cooperate in such an effort, and in fact would require the California Coastal Commission to continue to approve structures inconsistent with a local "planned retreat" policy.

Enacted in 1976, the California Coastal Act established state policies for public access, recreation, the marine environment, land resources and development within the Coastal Zone. The Coastal Act was enacted by the Legislature "as a comprehensive scheme to govern land use planning for the entire coastal zone of California. . . . '[T]he basic goals of the state for the coastal zone' are to: 'Protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and manmade resources.'" (*Yost v. Thomas* (1984) 36 Cal.3d 561, 565.). One of the express goals of the Coastal Act is to "assure orderly, balanced utilization and conservation of coastal zone resources." The Act, therefore, accommodates both development and preservation objectives. (Pub. Resources Code, § 30001.5, subd. (b).).

The wording of the Coastal Act does not suggest any intent by the California Legislature to preempt local planning. Rather, the Act provides local governments with authority to zone land to fit any of the acceptable uses under the policies of the Act. Local governments have the discretion to be more environmentally restrictive than the Act in permitting land uses. (Public Resources Code, § 30005; *Yost*, *supra*, 36 Cal.3d at pp. 572-573.) Still, actions of the California Coastal Commission may have the practical effect of frustrating the implementation of local policies that are more environmentally restrictive than those found in state law.

Coastal development permits are required for all development within the coastal zone including seawalls and other shoreline protection devices.[5] Currently, as noted earlier, the City of Solana Beach Municipal Code requires property owners in Solana Beach to seek a permit from the City before installing a shoreline protective device. The Solana Beach Municipal Code provisions regarding permitting of shoreline protection devices are more environmentally restrictive than Public Resources Code § 30235, in that the City provisions limit the availability of such devices to certain situations, and impose strict requirements as to how such devices must be designed and constructed. Furthermore, the Solana Beach Municipal Code is more proactive than the Coastal Act because the Municipal Code generally does not allow more intrusive shoreline protection devises such as seawalls when other feasible shoreline or coastal bluff protection measures are available. (Municipal Code, § 17.62.020(A).) The Municipal Code favors less intrusive measures such as seacave plugging and filling over seawalls and similar protective armoring. Permits for seacave plugging and filling are to be processed expeditiously in order to avoid the need for more intrusive measures such as seawalls. (Municipal Code, § 17.62.020(B).).

Although neither any California Court of Appeal nor the California Supreme Court has definitively settled the issue, it appears that Public Resources Code § 30235 gives property owners a statutory right to obtain from the California Coastal Commission permits for construction of shoreline protection devices under certain circumstances. As long as this statute remains on the books, the City would be powerless to implement a Planned Retreat strategy because, regardless of City policy, the California Coastal Commission would continue to approve seawalls or other structures intended to protect bluff-top properties.

Public Resources Code § 30235 provides as follows:

> "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. Existing marine structures causing water

[5] The Coastal Act defines "development" broadly enough to include structures such as sea walls, notch fills, and other cliff armoring devices. "'Development' means, on land, in or under water, the placement or erection of any solid material or structure:…"(Pub. Resources Code, § 30106.)

stagnation contributing to pollution problems and fish kills should be phased out or upgraded where feasible."

The use of the word "shall" within the statute indicates that property owners are entitled to such permits if the requisite conditions can be satisfied (i.e., if the proposed structures can be "designed to eliminate or mitigate adverse impacts on local shoreline sand supply"). Traditionally, the California Coastal Commission has treated its "Sand Mitigation Fee" as adequate mitigation to justify the approval of shoreline protection structures.

No court in any reported case has directly addressed the issue of whether § 30235 gives property owners, upon the proper showing, an absolute right to a permit for a seawall. A few reported court cases have mentioned or quoted § 30235, however, in a manner that suggests that its mandatory language is, in fact, mandatory. None of these cases, though, squarely holds that, upon a proper showing, the California Coastal Commission must issue a coastal development permit for a shoreline protective device. (See, e.g., *Pacific Legal Foundation v. California Coastal Commission* (1982) 33 Cal.3d 158, 164; *Barrie v. California Coastal Commission* (1987) 196 Cal.App.3d 8, 20; *Lechuza Villas West v. Superior Court* (1997) 60 Cal.App.4th 218, 224.)

One well-known reported Court of Appeal case has addressed a different issue that some observers have misread to indicate that California Coastal Commission approval under § 30235 is not mandatory. (See Titus, "Rising Seas, Coastal Erosion, and the Takings Clause: How to Save Wetlands and Beaches Without Hurting Property Owners," 57 Maryland Law Review 1279, 1374 (1998).) A close reading of the case does not support that conclusion.

In *Whaler's Village Club v. California Coastal Commission* (1985) 173 Cal.App.3d 240, the appellate court had to determine the proper judicial "standard of review" for determining the propriety of conditions imposed by the California Coastal Commission on the approval of a rock revetment to protect an applicant's shoreline homes. The conditions at issue required the homeowners to surrender easements that allowed public access to the affected beach. The specific issue before the court was whether the deferential "substantial evidence" standard of review should apply, or whether, instead, the nondeferential "independent judgment" standard was proper. By statute, the latter is appropriate only where a reviewing court is reviewing an agency action substantially affecting a fundamental vested right. The Court of Appeal held that the substantial evidence standard was appropriate because "Whaler's Village did not have a fundamental vested right to develop property in the coastal zone without a permit issued pursuant to the Coastal Act." (*Id.* at p. 254.).

Nothing in the decision suggests that, upon a proper showing, a property owner who has applied to the California Coastal Commission for a shoreline protection structure was not entitled to receive an approval. Rather, the court was concerned only with the propriety of the conditions of approval, which were upheld as being "reasonably related" to the impacts caused by construction of the revetment. (*Id.* at p. 261.) The fact that there is no "fundamental vested right" to develop property without a permit does not mean that the Commission can refuse to give effect to a statutory command that, on its face, requires the issuance of a permit when adequate mitigation can be formulated.

Another question regarding how to interpret § 30235 goes to the meaning of the words "*existing structures*" as they are used in the phrase in which the statute provides that various kinds of structures "shall be permitted when required to . . . protect existing structures[.]"

Third-year law student Todd Cardiff of California Western School of Law argues for a narrow reading of the term in a "comment" entitled, "Conflict in the California Coastal Act: Sand and Seawalls." He argues that "existing structures" refers only to structures that were in place in 1976, when the Coastal Act was enacted, and that the term does not embrace post-1976 structures that may exist at the time an applicant seeks approval of a shoreline protection structure. Mr. Cardiff bases his conclusion on his reading of the legislative history of the Coastal Act, the general policies underlying the Act, and what he considers to be a conflict between § 30235 and § 30253 of the Coastal Act.

Section 30253 states that "new development" shall "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."[6] (Emphasis added.)

To date, Mr. Cardiff's reading of the term "existing structures" has not been accepted either by any appellate court in a reported case or by the California Coastal Commission itself. Rather, the Commission has traditionally understood "existing structures" to be those in place when an applicant files a permit application for a shoreline protective structure. Such structures can include homes or other structures built after the effective date of the Coastal Act but at a time when no shoreline erosion problems were known to exist.

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[6] Public Resources Code § 30253 provides in full as follows:

> New development shall:
>
> (1) 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.
>
> (3) Be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development.
>
> (4) Minimize energy consumption and vehicle miles traveled.
>
> (5) Where appropriate, protect special communities and neighborhoods which, because of their unique characteristics, are popular visitor destination points for recreational uses.

Furthermore, neither the Solana Beach City Attorney nor the City's outside legal counsel for environmental issues sees any inherent conflict between § 30235 and § 30253. Rather, they read § 30253 as merely providing that the Commission cannot approve new homes or other "new development" where, at the time such development is proposed, it is clear that a seawall or similar protective device would be necessary to protect the new development. Section 30235 seems to address a different sort of situation: one in which a home or other structure – perhaps built after 1976 – is now facing erosion problems that were not evident when the structure was first approved. Section 30235 seems to require the Commission to approve permits for devices to protect such structures, provided that, as noted earlier, the proposed devices can be "designed to eliminate or mitigate adverse impacts on local shoreline sand supply[.]"

Mr. Cardiff's argument would likely conflict with the views of blufftop homeowners who would likely argue that a Planned Retreat Alternative could create an uncompensated "taking" of their property. As discussed below, the Planned Retreat Alternative, if effectively implemented at both the state and local level, would likely give rise to claims that the denial of permission to build protective structures constitutes an unconstitutional "regulatory taking" of private property without just compensation. Without predicting how such a challenge would fare in court, City Staff notes that, in determining whether a taking has occurred, courts generally examine what uses of the land were allowed or proscribed at the time title was acquired, not when structures were placed on the property. (See *Lucas v. South Carolina Coastal Council* (1992) 505 U.S. 1003, 1028 ("[w]here the State seeks to sustain regulation that deprives land of all economically beneficial use, we think it may resist compensation only if the logically antecedent inquiry into the nature of the owner's estate shows that the proscribed use interests were not part of his title to begin with").).

In short, there is no clear answer to the question of whether § 30235 protects only those structures that existed as of 1976. The traditional view, held by the California Coastal Commission, is that the statute does apply to structures post-dating 1976. Still, no reported Court of Appeal or California Supreme Court decision provides an unequivocal answer. Current understanding of the law, however, would require the California Coastal Commission to continue to issue coastal development permits for shoreline protection devices needed to protect homes built after 1976. This approach would frustrate any unilateral attempt by the City to implement the Planned Retreat Alternative.

Another barrier to the City's authority to implement the Planned Retreat Alternative is the potential for emergency permitting of shoreline protection structures by the California Coastal Commission. The Coastal Act provides that, in the face of an emergency, the Executive Director of the Commission may issue permits without having to comply with the normal procedural requirements of the Act. (Pub. Resources Code, § 30624; Cal. Code Regs, tit. 14, § 13136 et seq.) An "emergency" is defined as "a sudden unexpected occurrence demanding immediate action to prevent or mitigate loss or damage to life, health, property or essential public services." (Cal. Code Regs, tit. 14, § 13009.) Property owners would not have a vested right in structures built under emergency permits, however. In other words, the construction of shoreline protection under emergency conditions does not blossom into a right to build a permanent structure. Still, the California Coastal Commission could continue to issue emergency permits regardless of whether Solana Beach determines that "Planned Retreat" is desirable public policy.

Other provisions in the Coastal Act require the California Coastal Commission to issue coastal development permits as long as the proposed development is in conformity with the provisions of the Act and as long as issuance of the permit would not prejudice the ability of the local government to prepare a local coastal program. Public Resources Code § 30604, subdivision (a), provides as follows:

> Prior to certification of the local coastal program, a coastal development permit shall be issued if the issuing agency, or the commission on appeal, finds that the proposed development is in conformity with Chapter 3 (commencing with § 30200) and that the permitted development will not prejudice the ability of the local government to prepare a local coastal program that is in conformity with Chapter 3 (commencing with § 30200).

The Coastal Act directs the California Coastal Commission to balance the need to protect the beach with the need of homeowners to protect their homes. Public Resources Code § 30214, subdivision (b), provides: "It is the intent of the Legislature that the public access policies of this article be carried out in a reasonable manner that considers the equities and that balances the rights of the individual property owner with the public's constitutional right of access pursuant to § 4 Article X of the California Constitution."

Given the various provisions of the Coastal Act discussed above, implementation of the Planned Retreat Alternative would almost certainly require a change in state law. Implementation of the alternative, therefore, is beyond the authority of the City acting by itself.

B. Whether the Planned Retreat Alternative would involve the "Taking" of Private Property without Just Compensation

A comprehensive examination of the feasibility of the Planned Retreat Alternative must also consider whether such a policy could result in the "taking" of private property without just compensation. Eminent domain is the right of government to take private property for public use upon the payment of "just compensation." Both the United States and California Constitutions prohibit governmental agencies from taking private property for a public use unless just compensation is paid. (U.S. Constitution, Fifth Amendment; California Constitution, Article 1, § 19.) "Inverse condemnation" is the de facto taking of private party *without* the payment of just compensation. Under a long line of United States Supreme Court cases, a "taking" (or inverse condemnation) can occur without a governmental entity seeking to physically seize or occupy a piece of private property.

Because the entire coastline within the City has been developed, with numerous homes and their backyards extending to areas near the very edges of the bluffs along the shore, the Planned Retreat Alternative would necessarily entail, eventually, the loss of most of these homes. In light of the litigious character of modern California, it seems virtually inevitable that some of the owners of those lost homes will sue either the City or the California Coastal

Commission, or whatever other governmental entity might allegedly be “at fault,” to demand compensation for the lost property values. The discussion below examines the likely character of those arguments.

The primary “takings” arguments are likely to be as follows. First, blufftop owners could argue that, because San Diego County (by zoning the subject area for development), the State of California (by enacting § 30235), and the City of Solana Beach (by adopting the Shoreline and Coastal Bluff Protection Ordinance) gave property owners the reasonable expectation of being able to obtain shoreline protection structures to protect their homes, these agencies cannot now “change the rules” in a way that wipes out or grossly reduces the value of the investments made in reliance on the policies at issue. The second (and complementary or alternative) argument would be that the repeal of either § 30235 or the existing City Ordinance would lead to a complete denial of “all economic use” of the affected blufftop properties, since the properties would become useless for any economically viable purpose. Under both of these arguments, affected property owners would likely argue that their perceived “right” allows them to build structures even on public land (such as that owned by the City), since both § 30235 and the City’s Ordinance have created expectations of a continuing right to use such land if necessary.

According to the United States Supreme Court, “regulatory takings” result when a government agency, in the exercise of its police power, adopts or enforces a regulation that “goes too far,” either by failing to substantially advance legitimate state interests or by denying the owner all economically beneficial or productive use of his land. (*Pennsylvania Coal Co. v. Mahon* (1922) 260 U.S. 393, 415; *Lucas v. South Carolina Coastal Council* (1992) 505 U.S. 1003.) Compensation might be required even in the absence of a denial of the full economic use of property, depending on the reasonable “investment-backed expectations” of property owners who spent money on their land in good faith reliance on policies in effect at the time of their investments. (See *Penn Central Transportation Co. v. City of New York* (1978) 438 U.S. 104, 124.).

Property owners can obtain redress for regulatory takings by bringing an action in inverse condemnation to recover damages for the injury to, or loss of, property. Courts decide whether a regulation is a taking by weighing its importance, economic impact, and interference with “investment-backed expectations.” Balancing these factors is an inherently subjective process; and the facts of each case must be examined carefully. In performing the required balancing, the court must consider, among other factors, whether the government tailored the regulatory constraints it imposed on the use of property to only those that were necessary to achieve the public purpose of the regulation at issue. The balancing test employed by courts suggests that regulations protecting relatively insignificant public interests would warrant a lower threshold for finding a taking than regulations that protect a more important public interest.

A regulation may not be Draconian enough to cause a taking when the regulation destroys the economic utility of only one part of a lot, as long as the parcel as a whole remains valuable. Under the Planned Retreat Alternative, some property owners might lose their homes, while others, at least in the initial period, might lose only portions of their backyards. The latter scenario would raise the question of *how much* property must be lost for a taking to occur.

Although the United States Supreme Court has never precisely defined how much must be taken to constitute a loss of all economically beneficial or productive use of land, at least two lower federal courts have found wetland-protection regulations to be takings when they prevented development and decreased property values by roughly ninety percent. (*Florida Rock Industries, Inc. v. United States* (Fed. Cir. 1994) 18 F.3d 1560; *Formanek v. United States* (1992) 26 Cl.Ct. 332.).

The Planned Retreat Alternative would not result in a loss of property until some time in the future, when coastal bluff erosion eventually leads to collapse of the bluffs. Two Supreme Court cases concerning coal mining in Pennsylvania, when read together, imply that a regulation that eventually curtails the useful lifetime of real property is less likely to be a taking than a regulation requiring an immediate curtailment. (*Pennsylvania Coal Co. v. Mahon* (1922) 260 U.S. 393; *Keystone Bituminous Coal Ass'n v. DeBenedictis* (1987) 480 U.S. 470.) Still, bluff erosion under the Planned Retreat Alternative may proceed at a pace that does not allow recent purchasers time to fully amortize the value of their investments. This fact would tend to strengthen any claim that the Alternative would effectively deny all economic use of properties located along the tops of the City's bluffs.

Some individuals have raised the reasonable question of whether any blufftop property owner really has a "right" to build a structure on *someone else's* property (e.g., bluff faces owned by the City). The answer to this question seems to be that, although the City, citing the traditional "right to exclude others" from its property, could certainly decide to refuse to make its property available for shoreline protection purposes in the future, such a exclusion might give rise to a takings claim. Such a claim would likely be premised on the notion that the *past practice*, pursuant to § 30235 and the City Ordinance, of permitting structures on public property has created *expectations* that such permission will continue to be granted in the future. Although such permission can be rescinded, affected landowners could argue that such a "change in the rules" would frustrate what they regard as their "reasonable investment-backed expectations" and thus would deprive them of what they consider to be their ongoing right to protect their properties by building structures on public property if need be.

Two common law doctrines affect the reasonable investment-backed expectations of coastal property owners. First, according to the law of accretion and reliction (or "the law of erosion"), ownership migrates inland when shores erode. Thus, where long-term geological processes create a landward retreat of a shoreline, the boundary separating an upland property from a seaward property will continually move landward. The landward property owner is on notice of this fact, and has no viable claim against the seaward property owner.

Under California law, the State of California owns the tidelands and submerged lands along the coast. (Civil Code section 670). Thus, under common law, a landward owner facing geological forces gradually eroding a seashore would have to recognize that, as the shore recedes, the landward owner would lose acreage to the State. (See Titus, supra, at pp. 1364-1371.).

In the absence of § 30235, a blufftop property owner unhappy with the Planned Retreat Alternative might face a strong argument that the "law of erosion" and "Public Trust Doctrine" put him/her on notice that, as the bluffs eroded, his or her property boundary would recede accordingly. The property owner might counter by arguing that San Diego County zoning that permitted bluff top development created “reasonable investment-backed expectations” on which the original developer relied, and that such zoning, once in place, created a continuing governmental duty to protect property owners “lured” into blufftop areas. (County zoning governed the City prior to its relatively recent incorporation.).

Section 30235 makes the legal issues even more complicated. Arguably, the State of California, by enacting that statute, superseded the common law of erosion and the traditional Public Trust Doctrine by creating a statutory policy explicitly intended to protect landward property owners from shoreline retreat. It could also be argued that the City’s Shoreline Protection Ordinance also created investment-backed expectations; but the relative late date of enactment of the Ordinance (1994) makes it far more likely that blufftop developers and owners relied to a much greater degree on the original County of San Diego zoning and on § 30235, which has been in place since 1976. It is not clear whether, under the circumstances, the City could be held responsible for actions taken by the County prior to incorporation. The City has certainly inherited conditions created by County zoning.

In laying out these various arguments, neither the Solana Beach City Attorney nor the City’s outside legal counsel intend to predict the outcome of a takings case that might be filed after implementation of the Planned Retreat Alternative. Notably, if the City were to choose to no longer issue permits for shoreline protection, § 30235 would remain on the books absent legislative repeal, and thus would likely protect blufftop owners who otherwise could lose their homes or backyards. Absent such erosion, presumably no takings cases would be filed against the City.

In the event that both the State and the City, on parallel tracks, implement the Planned Retreat Alternative by repealing § 30235 and by modifying or repealing the City’s Shoreline and Coastal Bluff Protection Ordinance, then property owners could file actions against either the State or the City or both. Such landowners, as noted earlier, would likely argue that repeal of the previously-protective provisions would lead to a complete loss of the economic use of their property, and that compensation is also required because the landowners relied to their detriment on those protective policies (and thus had “reasonable investment-backed expectations” that the protections would remain in place). The State and City could invoke the law of erosion and Public Trust Doctrine to support an argument that such property owners should have known that they, not the seaward landowner, would have to bear the losses of acreage caused by natural erosive forces. The landowners would likely respond that the enactment of (i) County zoning, (ii) § 30235, and (iii) the 1994 Ordinance modified the common law rules by creating expectations that government would permit people to live near the bluff-tops and allow them to build protective structures to prevent threatening erosion.

The outcome of any litigation involving these arguments cannot be predicted. It is clear, though, that any such takings arguments would at least be plausible, and might possibly succeed. A loss by the City in such litigation could have very severe economic consequences because of the very high property values of the homes along the bluffs. Notably, if the City modified or repealed its Ordinance while § 30235 remained in effect, the subsequent repeal of that statute could be the governmental action that is the proximate cause of any resulting taking. The State would therefore be a more logical target than the City for a takings lawsuit. A legally riskier scenario would be to implement a local Planned Retreat policy after the Legislature has already modified or repealed § 30235. Under the latter scenario, the City's elimination of policies intended to protect property investments might be seen as the proximate cause of any resulting economic losses. Under that scenario, the City might be a logical target for legal attack.

C. The Legal Effect of Having an Approved Local Coastal Program

Under the Coastal Act, each coastal county and city is required to submit a local coastal program ("LCP") to the California Coastal Commission. The LCP contains land use plans, zoning ordinances, and other implementing actions that implement the requirements and policies of the Coastal Act at the local level. The City of Solana Beach is in the process of obtaining California Coastal Commission certification of the City's proposed LCP. Consideration by the City of the draft LCP has been postponed until the review period for this MEIR has passed.

If the California Coastal Commission certifies the LCP, the authority to issue certain coastal development permits, including permits for shoreline protection, would be shifted to the City. (Pub. Resources Code, § 30519, 30600.) The City's action on permit applications, however, would still be appealable to the California Coastal Commission. (Pub. Resources Code, § 30603.) Therefore, even if Solana Beach had a certified LCP in place, its ability to implement a Planned Retreat policy would still be limited by the California Coastal Commission and its obligations under § 30235.

D. The Roles of Other Public Agencies

Under state and federal law, there are a number of agencies with responsibility to plan for and respond to coastal erosion issues. Responding to coastal erosion at the state level is the responsibility of the Department of Boating and Waterways. That department is California's primary agency responsible for working to restore eroded beaches and protecting *public* coastal infrastructure. Sections 65 through 67.3 of the State Harbors and Navigation Code assign to the Department the responsibility for studying shoreline erosion, constructing protective works, and administering state funds for the local share of federal projects. Sections 69.5 through 69.9 assign to the Department responsibility for administering the California Beach Restoration Program. The mission of the program is to preserve and protect the California shorelines by restoring and maintaining natural and recreational beach resources and by minimizing economic losses caused by natural and human-induced beach erosion.

Planning responsibilities for addressing coastal erosion is shared between multiple agencies in California. The federal Coastal Zone Management Act requires that state coastal management programs include a planning process for assessing the effect of, and studying and evaluating ways to control, or lessen the impact of, shoreline erosion, and to restore areas adversely affected by such erosion. (16 U.S.C. § 1455(d)(2)(I).) The California Coastal Act assigns primary responsibility for carrying out the California coastal management program to the California Coastal Commission and the State Coastal Conservancy.

The California Coastal Commission is the lead agency responsible for carrying out California's coastal management program by planning for and regulating development in the coastal zone consistent with the policies of the California Coastal Act. The California Coastal Commission's role in land use planning is discussed more fully above.

Through coastal land acquisition and resource restoration and enhancement programs, State Coastal Conservancy complements the planning and regulatory activities of the California Coastal Commission. The Coastal Conservancy uses entrepreneurial techniques to purchase, preserve, improve, and restore public access and natural resources along the California coast.

2.4.2 Intensity

Under this alternative, the seacliffs would be allowed to naturally erode, allowing the landward boundary of the beach to occur naturally. To protect property and personal safety, two setback lines would be established to limit new development beyond the point of estimated bluff retreat. Under this strategy, the City would be obliged to acquire properties west of the planned retreat lines through purchase or eminent domain. It is assumed that the City would have to acquire 50 single-family homes and 69 condominium units that may be affected by natural erosion over a 100-year project life.

2.4.3 Location

The 50 single-family homes and 69 condominium units are located along the bluffs in Solana Beach (see Figures 2-1 to 2-7) and are affected by the 100-year setback line as described in Section 2.4.

2.4.4 Implementation

An economic analysis for implementing this Alternative was prepared by Economics Research Associates (ERA) in May 2002 (refer to Appendix D). The coastal retreat policy alternative involves 1) Purchasing homes within the 50- and 100- year retreat zones, 2) relocating residents, and 3) relocating existing utilities, as described below.

Cost to Purchase Homes

The estimated average cost per square foot for ocean view single-family homes is $694 and the estimated average cost per square foot for ocean view condominiums is $635. These estimates are for planning purposes and are not appraisals.

It is estimated that the sales price of single-family homes in the retreat zone, which were sold from 1997 to 2001 (there were no sales reported so far in 2002), appreciated at an average rate of 4.3 percent per year in real terms, above the inflation rate. Condominium prices per square foot may have increased by as much as 7.2 percent from 1997 to 2002. Most of this time was a period of significant economic expansion and should not be used for long-term projections. It is more appropriate to review long-term growth rates over a period that at least includes one economic recession and one expansion, such as the 1990 to 2000 period. Based on data reported by the San Diego Regional Chamber of Commerce, which was adjusted to account for inflation, real home values in Del Mar increased by an annual compounded growth rate of 2.1 percent while home values in Encinitas grew by a 0.5 percent annual rate from 1990 to 2000. Countywide, home values did not exceed inflation, or grow in real terms, from 1990 to 2000. Published data was not available for Solana Beach specifically for this period. Prices have risen sharply, well above inflation, during 2001 and 2002.

While there has been a significant increase in countywide home values during the last few years, the increase is compensating for the significant decline in values that occurred in the early and mid-1990s during the region's recession. The higher than average increase that occurred in Del Mar and Encinitas reflects the desirability of coastal properties. Also, the disproportionate increase in income among upper-income households may have bid up the price of high-end properties faster than average. Given the limited resource of coastal properties, the projected growth in the region, and likely increases in wealth among upper-income households, the coastal properties in Solana Beach should expect continued price appreciation.

It is assumed that beginning in 2014, the City will acquire approximately 5 single-family homes every ten years and several blocks of condominiums every twenty years over the 100-year project life. Table 2-4 shows the estimated cost (in year 2002 dollars) to acquire homes in today's values and considering real appreciation. A 2.0 percent real (inflation-adjusted) rate of annual appreciation was used. While a higher-rate would not be unreasonable, the long-term uncertainty about each property's land and foundation stability would mitigate appreciation.

The cost of acquiring the 50 single-family homes was an estimated $57.4 million without appreciation and $207.7 million with 2.0 percent real annual appreciation. The cost of acquiring the condominiums was an estimated $72.6 million without appreciation and $143.6 million with real appreciation. The estimated total acquisition cost was $130.0 million without real appreciation and $351.4 million with real appreciation (in year 2002 dollars).

Table 2-4
Cost to Acquire Homes and Condominiums in 100-Year Retreat Zone
(Year 2002 Dollars)

Assumed Real Appreciation Rate:		0%		2.0%	
Average Square Feet:					
Single Family		1,656		1,656	
Condominium		1,242		1,242	
Single Family Homes		***Without appreciation:***		***With real appreciation:***	
Year	**# Single Family**	**Cost Per S.F.**	**Total Cost**	**Cost Per S.F.**	**Total Cost**
2002	0	$694	$0	$694	$0
2004	0	$694	$0	$722	$0
2014	5	$694	$5,744,502	$880	$7,285,418
2024	5	$694	$5,744,502	$1,073	$8,880,883
2034	5	$694	$5,744,502	$1,307	$10,825,747
2044	5	$694	$5,744,502	$1,594	$13,196,526
2054	5	$694	$5,744,502	$1,943	$16,086,491
2064	5	$694	$5,744,502	$2,368	$19,609,343
2074	5	$694	$5,744,502	$2,887	$23,903,680
2084	5	$694	$5,744,502	$3,519	$29,138,452
2094	5	$694	$5,744,502	$4,290	$35,519,610
2104	5	$694	$5,744,502	$5,229	$43,298,207
	50	**Total**	**$57,445,021**	**Total**	**$207,744,357**
Condominiums					
Year	**# Townhouses**	**Cost Per S.F.**	**Total Cost**	**Cost Per S.F.**	**Total Cost**
2002	0	$635	$0	$635	$0
2004	14	$635	$14,725,006	$661	$11,486,758
2024	14	$635	$14,725,006	$982	$17,068,718
2044	14	$635	$14,725,006	$1,459	$25,363,216
2064	14	$635	$14,725,006	$2,168	$37,688,405
2084	13	$635	$13,673,220	$3,222	$52,002,774
2104	0	$635	$0	$4,787	$0
	69	**Total**	**$72,573,246**	**Total**	**$143,609,871**

Source: San Diego Regional Chamber of Commerce and Economics Research Associates

Table 2-5
Cost to Relocate Residents in 100-Year Retreat Zone
(Year 2002 Dollars)

	Estimated Relocation Cost Per Home	# of Homes	Total
Cost Per Single Family Home	$100,000	50	$5,000,000
Cost Per Condominium	$50,000	69	$3,450,000
			$8,450,000

Source: Economics Research Associates

Cost to Relocate Residents

Using an estimated cost of $100,000 to relocate families living in single-family homes and $50,000 to relocate families living in condominiums, the total cost would be $8.5 million (in year 2002 dollars).

Relocation costs could include the following:

- rent for similar quality housing during the transition time between homes;
- moving and storage costs;
- increase in value of homes during the transition period;
- the capitalized value of additional property taxes and homeowner fees;
- fees and closing costs for a new mortgage;
- loan termination fees on existing mortgages;
- income tax impact from capital gains; and
- other costs.

Some relocation costs may be avoided if condemnation is not required.

Cost to Relocate Utilities

Existing utilities that would need to be relocated include the stairways at Tide Park, Fletcher Cove, Seascape Surf and Del Mar. Shoreline protection devices such as seawalls, riprap, seacave fills/plugs, and gunite covering would need to be destroyed. Table 2-6 presents the estimated cost of relocating and demolishing these structures to be $4 million (in constant, year 2002 dollars).

Total Cost

As Table 2-7 shows, the estimated total cost to acquire the 119 homes in the 50- and 100-year retreat zones and relocate their occupants is approximately $142.5 million without appreciation, and $363.8 million with real appreciation, (in year 2002 dollars).

The actual current year dollar amounts will be higher, depending on inflation. Also, prices could be higher if properties are acquired through condemnation. Finally, prices based on estimated appreciation could be higher or lower, depending on the actual appreciation rate.

The actual current year dollar amounts will be higher, depending on inflation. Also, prices could be higher if properties are acquired through condemnation. Finally, prices based on estimated appreciation could be higher or lower, depending on the actual appreciation rate.

Table 2-6
Cost to Relocate Utilities in 100-Year Retreat Zone
(Year 2002 Dollars)

Utilities	Cost
Replace Stairways at Tide Park, Fletcher Cove, Seascape Surf, and Del Mar Shores Terrace	$ 3.8 million
Prepare plans, obtain permits, safely demolish, load and transport Tide Park seawall and sea cave plug, Del Mar Shores rip rap and any potentially existing pre-incorporation built sea cave in fill/plug structures that may exist.	$ 0.02 million
Total	**$ 4.0 million***

* Cost estimate includes only those structures owned by the City and does not include privately owned structures.

Source: City of Solana Beach and Economics Research Associates

Table 2-7
Cost of Planned Retreat Alternative Summary
(Year 2002 Dollars)

	Without appreciation:	***With real appreciation:***
Cost to Acquire Homes		
Single Family	$57,445,021	$207,744,357
Condominiums	$72,573,246	$143,609,871
Cost to Relocate Residents		
Single Family	$5,000,000	$5,000,000
Condominiums	$3,450,000	$3,450,000
Cost to Relocate Utilities		
	$4,000,000	$4,000,000
Total Project Cost	**$142,468,266**	**$363,804,228**

Source: Economics Research Associates

Loss of Property Tax Revenue

In addition to the total costs to acquire the 119 homes and relocate the occupants, the City would lose 16.1 percent of one percent of the assessed value of the properties. Loss of property tax would not represent a significant reduction in City revenues.

Potential Funding Sources

The issue of beach retreat is well known at the local, state and national level; thus, there are several funding programs designed to help localities faced with beach retreat.

Federal Government Sources

The USACOE is the Federal Agency charged with helping localities protect their coastlines from storm damage and harmful erosion. USACOE utilizes both structures and sand replenishment to protect beaches. To receive Federal funding, the local government must approach its local congressional representative and request an erosion study or project. The congressional representative can present the study or project for approval in two ways:

1. As a bill (or part of a bill) passed by both Houses, or

2. As a signed resolution from a Senate subcommittee (the Senate Subcommittee on Water and Power, for example)

Once authorized by Congress, the project must receive an appropriation in the Annual Water and Energy Bill or the Water Resources Development Act (passed every two years). The amount available varies widely and depends upon project needs and budget availability.

Federal policy is that lands involved in Federally sponsored projects are to be provided by the local project partner. As a last resort, the Federal government can acquire property through condemnation. Owners of condemned property would be compensated for the market value of their property. This process has never been used in California.

State Government Sources

The California Public Beach Restoration Act (Assembly Bill No. 64), passed in October, 1999, establishes a funding program for restoration, enhancement and nourishment of public beaches. Fundable activities include planning and design activities as well as feasibility and environmental studies, with the following funding limits:

- Planning, design and permitting must not exceed 15 percent of total project cost;

- The cost of studies to characterize, inventory or assess project areas must not exceed 5 percent of total project cost;

- 100 percent of nonfederal project construction cost for restoration, nourishment, or enhancement of coastal state parks and state beaches with placement of sand on the beach or nearshore; 85 percent for nonstate beaches (with a 15 percent match from local sponsors).

The Department of Boating and Waterways administers the program. The program received an initial appropriation of $10 million in FY 2000-01, and the proposed FY 2002-03 budget is $6.5 million. The Act dictates that 60 percent of funds are to be used in projects along the central and southern coast and 40 percent are to be used for projects in the north. This program does not fund the acquisition of project-related properties.

Potential Local Sources

- Beach Sand Mitigation Fee

  The City of Solana Beach may be able to charge a Beach Sand Mitigation Fee authorized by the California Coastal Commission. The Beach Sand Mitigation fee can be assessed on all developments in the coastal zone that may result in increased beach loss (such as the construction of seawalls). This program was established to quantify the cost incurred by such projects. The amount of the fee is determined by complex formula that reflects the scientific principles of erosion. The San Diego Association of Governments has an agreement with the Coastal Commission to collect the fees and implement fund-related projects. In the past, fees for individual projects have ranged from approximately $2,000 to $8,000. Funds collected are used for beach protection and sand replenishment projects region-wide. This program is only available in San Diego County and has only been used in Encinitas (in cases where the bluffs are in public ownership).

- General Obligation Bonds

  The City may issue general obligation bonds that are supported by Ad Valorem property tax overrides. A two-thirds voter approval is required to approve the indebtedness and overrides. General Obligation bond proceeds can only be used to finance the acquisition and construction of real property. Thus, the proceeds may be used to fund the capital costs associated with the Sand Replenishment Program Alternative, or the property acquisition costs associated with the Planned Coastal Retreat Alternative. The General Obligation Bond is one of the most secure and lowest cost forms of public financing. A 10-cent override per $100 in assessed valuation would yield approximately $1.85 million per year for debt service, which would yield approximately $26.9 million in capitalized proceeds assuming 30-year amortization at 6.0 percent interest.

- Sales Taxes

The State Legislature may increase statewide sales and use taxes, and counties may increase local sales taxes for special purposes up to an aggregate total of 1 percent. Only a few cities in the state have obtained special state legislation to levy supplemental sales taxes. If the sales tax is used for a special purpose, a two-thirds voter approval is required. If the tax is for a general purpose, a simple-majority vote is required. The City of Solana Beach raised $2.11 million in sales tax revenue in FY 2000-01 with a 7.75 percent tax rate, of which the City receives 1 percentage point. A 25 basis point increase would generate $528,000 additional revenue per year, equivalent to a capitalized value of approximately $7.3 million assuming 30-years at 6.5 percent.

- Transient Occupancy Taxes (TOT)

This tax is charged to hotel guests as a percentage of room rates. Currently, the City of Solana Beach currently charges a 10 percent hotel occupancy tax rate to yield $545,000 per year in FY 200-01. Increasing this rate by 200 basis points to 12 percent, which would still be within the range of TOT rates that cities charge in California, would generate approximately $0.1 million per year, equivalent to a capitalized value of approximately $1.52 million assuming 30-years at 6.5 percent.

- Utility Users Tax

Many cities levy a utility users tax, which is assessed on all utility users within the jurisdiction. The City of Solana Beach currently does not levy such a tax. A majority of voters would have to approve this tax for general purposes, and two-thirds would have to approve the tax for a specific purpose.

- Real Property Transfer Tax

The County levies a real property transfer tax of $1.10 per $1,000 of assessed valuation when a property is sold and transferred. The City levies a $0.55 transfer tax per $1,000 of assessed valuation that is credited against the County's levy. Solana Beach generated $100,000 in real property transfer tax revenue in FY 2000-01. Some cities in California levy a "non-conforming" tax, at a rate above $0.55. A $3.00 rate per $1,000 in Solana Beach, for example, would yield approximately $0.45 million per year, equivalent to a capitalized value of approximately $6.2 million assuming 30-years at 6.5 percent. This tax would require a majority vote approval if raised for general use, and two-thirds if designated for a specific use.

- Franchise Fees

The City of Solana Beach collects approximately $290,000 from franchise fees levied on various utilities. State statute limits payments from gas and electric franchises to General Law cities to 2 percent of the franchisee's gross annual receipts associated with the franchises. Increases in this fee are negotiated.

- Storm Drain Fees

Some cities have levied fees for storm drains to finance capital improvements and operating costs to manage drainage. For example, San Diego currently collects a fee of 95 cents per single-family residence and a fee based on water use for multi-family, commercial, and industrial properties. Currently, the City of Solana Beach does not levy a storm drain fee.

- Community Facilities District (Mello-Roos)

Cities can form a Community Facilities District to levy a special, non-ad valorem parcel tax, pursuant to the Mello-Roos Community Facilities Act of 1982. Parcel taxes can be based on custom formulas that are more flexible and do not require a benefit nexus as required for benefit assessment districts. The parcel tax requires two-thirds voter approval. Under Mello-Roos, property owners can approve a parcel tax if there are less than 12 registered voters, with the votes weighted according to acreage. The tax may finance the acquisition, construction or improvement of any real or tangible property with a useful life of five years or more. Bonds may be issued, supported by the annual tax revenues. While a Community Facilities District can be formed for an area that is smaller than the jurisdiction, the magnitude of the costs for Beach Sand Replenishment Program or the Planned Coastal Retreat alternative would probably require a large district. It would be less costly to finance capital costs using a citywide General Obligation Bond. Unlike a General Obligation Bond, however, Mello-Roos revenues can be used to fund ongoing operating and maintenance costs.

- Benefit Assessments

Benefit assessment districts and the issuance of bonds are authorized under the 1911 and 1913 Improvement Acts, the Landscape and Lighting District Act, and the 1915 Bond Act. The assessment is levied on properties to fund public improvements and maintenance that add a special benefit to the properties within the district. Under Proposition 218, assessment districts now require a simple majority approval of property owners and a higher standard of benefit nexus which limits improvements to those that provide benefits specifically to the properties within the district, as oppose to a general benefit.

- Infrastructure Financing Districts

An Infrastructure Financing District (IFD) uses property tax increment within the district to fund improvements, similar to Redevelopment Project Areas. Unlike Redevelopment Project Areas, IFDs are designed for areas with land that is substantially undeveloped, with significant tax increment potential. The capital projects funded can benefit areas larger than the district itself. The district is formed by a simple majority vote of registered voters within the district if there are at least twelve registered voters within the district. A two-thirds vote is required to issue bonds. Given the IFD's financing based on tax increment, and IFD in a mostly built-out city such as Solana Beach would have to come from private redevelopment, infill development, and general property appreciation. Also, under the Planned Coastal Retreat alternative, if the district includes the properties that are to be acquired, the tax increment could be diminished.

- Purchase and Lease Back of Homes

Given the uncertainties regarding long-term coastal property values, and the consequent cost to implement this alternative, it may be less costly in the long-run to purchase the properties (either the land or the total property) and lease them back to the occupants, with terms tied to planned erosion. The property owners would receive compensation and could still enjoy use of the property for a long period, perhaps as long as 50-100 years depending on when the properties are purchased. The revenue received from lease payments could help pay for a portion of the purchase costs. Also, some of the sales could be on a voluntary basis, in which case relocation costs could be avoided or deferred since occupants would not have to move.

3.0 ENVIRONMENTAL IMPACT ANALYSES

3.1 Geology and Soils

3.1.1 Environmental Setting

The following discussion of existing geologic conditions is based on the geotechnical evaluation/ assessment report prepared for the project area (AMEC, 2001); a review of general geotechnical and geologic literature of the project study area; and analysis of geologic maps prepared by Kennedy (1975), Jennings (1975), and others.

Topography

The project site is located within the coastal plain of the Peninsular Ranges Geomorphic Province (Figure 3.1-1). This province is generally separated into two distinct geomorphic components, the northwest-trending mountain ranges, foothills, and intervening valleys, which comprise the eastern and central portions of the province, and the coastal plains, which occupy the western portion of the province. The coastal plain consists of numerous marine and nonmarine terraces dissected by stream valleys.

Solana Beach lies along the western edge of the coastal plain. The coastal plain in this area is dissected by the San Elijo Lagoon on the northern end of Solana Beach and the Del Mar Estuary (San Dieguito River) along the southern edge of Solana Beach. Elevations range from near sea level to approximately 90 feet MSL at the bluff top near the intersection of Pacific Avenue and Hill Street.

The shelf offshore lies approximately 15 to 50 feet deep, is rocky, and supports abundant kelp growth. The shelf width is about 2.5 miles (Flick, 1994).

Soils

The United States Department of Agriculture (USDA) 1973 Soil Survey of the San Diego area recognized one soil mapping unit and one land type in the study area (USDA, 1973). These are the Marina loamy coarse sand (M1C) mapping unit and coastal beaches land type (Cr). The majority of the study area is mapped as Marina loamy coarse sand. Coastal beaches are mapped as two narrow oceanfront units in the northern and southern portions of Solana Beach (see Figure 3.1-2). The identified soil/land types are described in the USDA soil survey as follows:

Marina Loamy Coarse Sand, 2 to 9 percent slopes (M1C): The Marina series consists of somewhat excessively drained, very deep loamy coarse sands derived from weakly consolidated to noncoherent ferruginuous eolian sand. These soil series are formed on old beach ridges. Located on ridges, the Marina loamy coarse sand, with 2 to 9 percent slopes, has a dominant slope of 4 percent. The soil is characterized by slow to medium runoff, a holding

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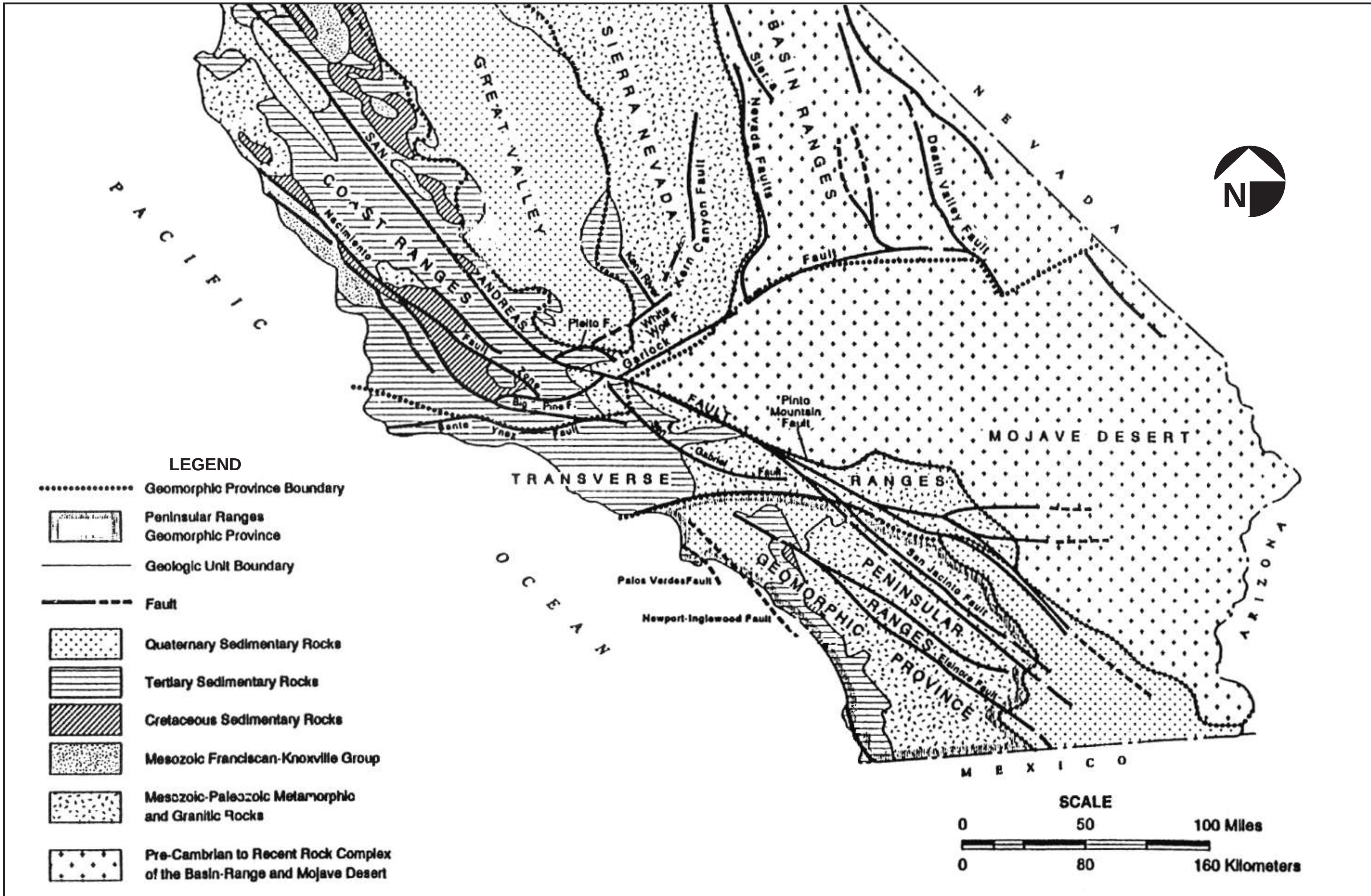

SOURCE: CDMG, Note Numbeer 35

FIGURE

3.1-1

Peninsular Ranges Geomorphic Province

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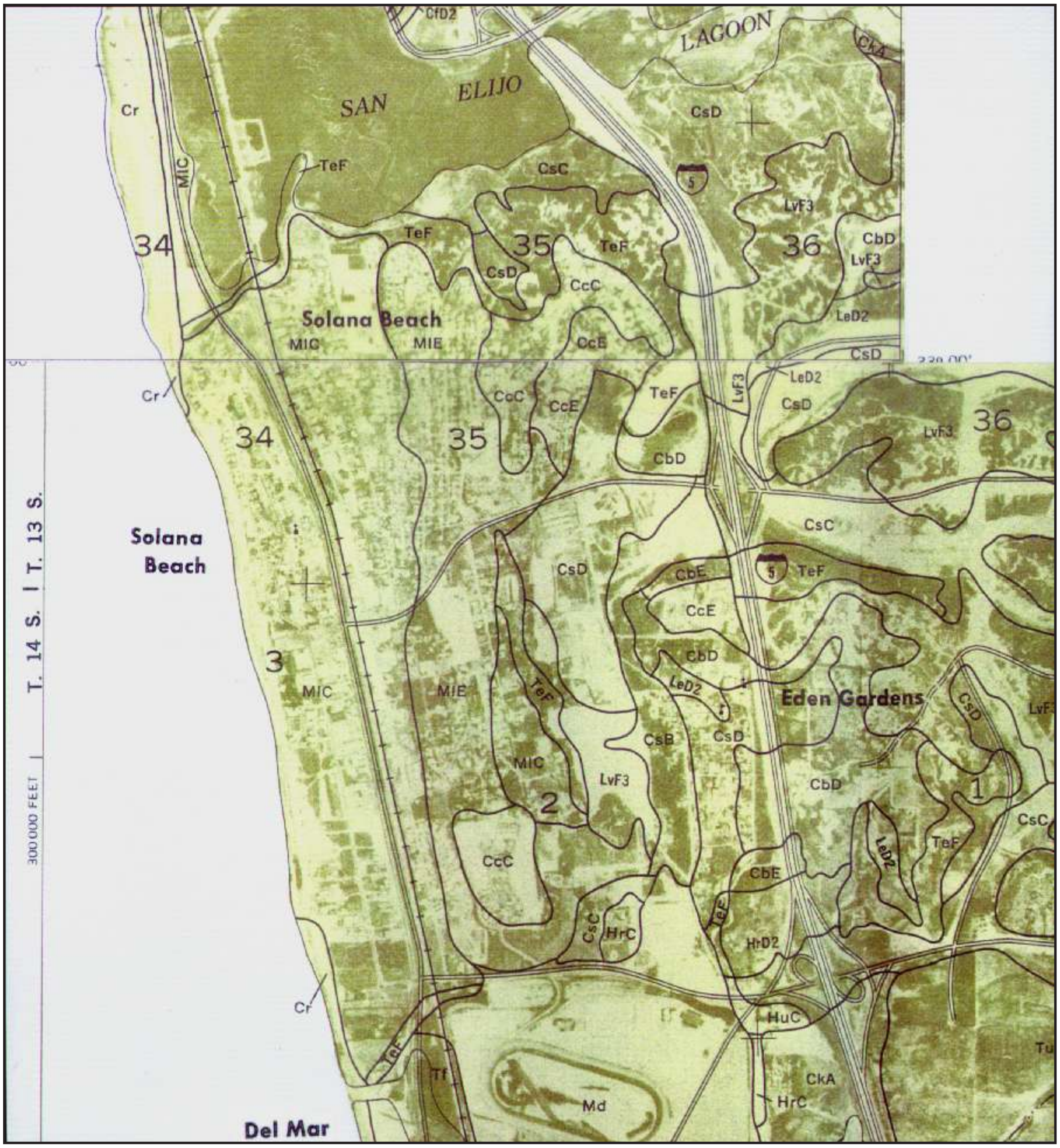

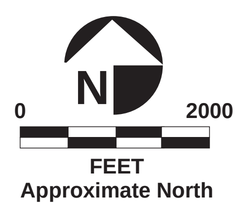

SOURCE: U.S. Dept of Agriculture, 1973, Soil Survey, San Diego Area, California: Sheet Nos. 33 (Encinitas Quadrangle) and 43 (Del Mar Quadrangle)

FIGURE

3.1-2

Soil Map

amec

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capacity of 4 to 5 inches, and rapid permeability (6.3 to 20 inches per hour). The erosion hazard is slight to moderate. The rooting depth is more than 60 inches.

Coastal Beaches (Cr) land type occurs as gravelly and sandy beaches along the Pacific Ocean where the shore is washed and rewashed by ocean waves. Part of this land type is likely to be covered with water during high tide and stormy periods.

Geologic Setting

The general vicinity of the study area is underlain by the Tertiary sedimentary rocks capped by the Quaternary marine and non-marine sediments deposited on a series of wave-cut terraces (Figure 3.1-3).

The Eocene-aged sedimentary rocks of the La Jolla and Poway Groups underlying the study area and its vicinity were deposited in a continental shelf environment. It is believed that these rocks were deposited in the subsiding San Diego sedimentary basin, forming a thick sedimentary sequence (Kennedy, 1975). The rock units of the La Jolla Group exposed in the study area are the middle Eocene (49 to 47 million years old) Delmar Formation and the Torrey Sandstone. The Delmar Formation transitions into Torrey Sandstone vertically and laterally.

Four erosional terraces are recognized in the site vicinity area. The three younger terraces are correlated with the late Pleistocene (120,000 years old) Bay Point Formation, and the oldest terrace is correlated with the late to early Pleistocene (1,180,000 to 120,000 years old) Lindavista Formation (Tan and Kennedy, 1996; Kennedy, 1975). In general, three principal elements are recognized in erosional coastal terraces: a wave-cut platform, an inner edge (shoreline angle), and a seacliff (Figure 3.1-4). A wave-cut platform has a shallow seaward dip of 0.01 to 0.02 feet per foot (Ritter and others, 1995; Group Delta, 1998). The modern wave-cut platform formed as the seacliff retreats stands slightly below water level at the high tide. An inner edge marks the highest sea level maintained during any glacial/interglacial time. The older uplifted platforms are overlain by marine and non-marine terrace deposits. The number and spacing of terraces are determined by the rate of tectonic uplift and the nature of the coastal processes. The marine terrace deposits in the study area are generally correlated with the Bay Point Formation.

Coastal Bluff Geology

The on-site materials are described below, from oldest (Delmar Formation) to youngest (Artificial Fill).

Delmar Formation

The middle Eocene-age (49 to 47 million years old) Delmar Formation of the La Jolla Group crops out at the northernmost part of Solana Beach, north of 633 Pacific Avenue. It is composed of yellowish-green sandy claystone interbedded with gray, coarse-grained sandstone (Kennedy, 1975). In the northern part of Solana Beach, where it is exposed at the base of the

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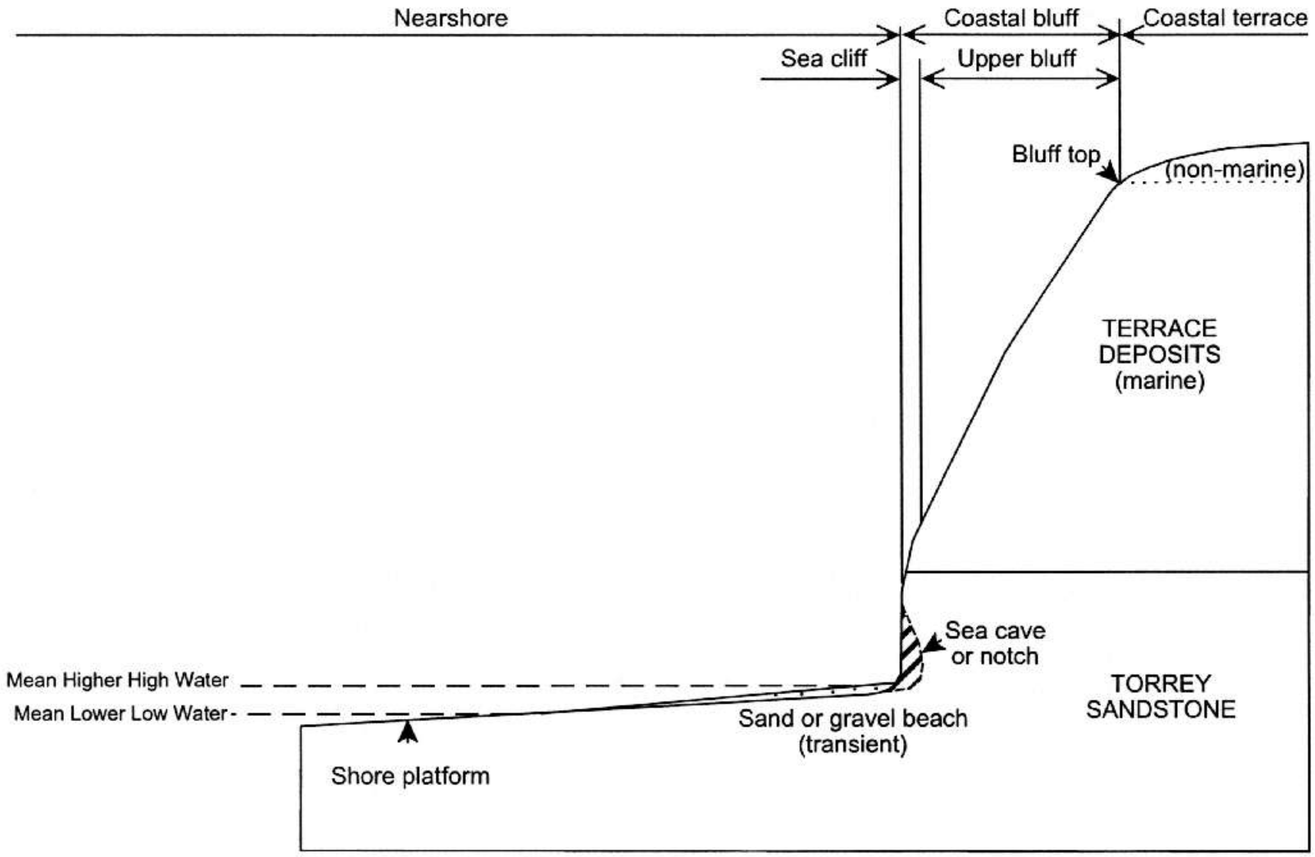

SOURCE: Drawing Modified from Group Delta, 1998

FIGURE

3.1-3

Typical Erosional Coastal Profile

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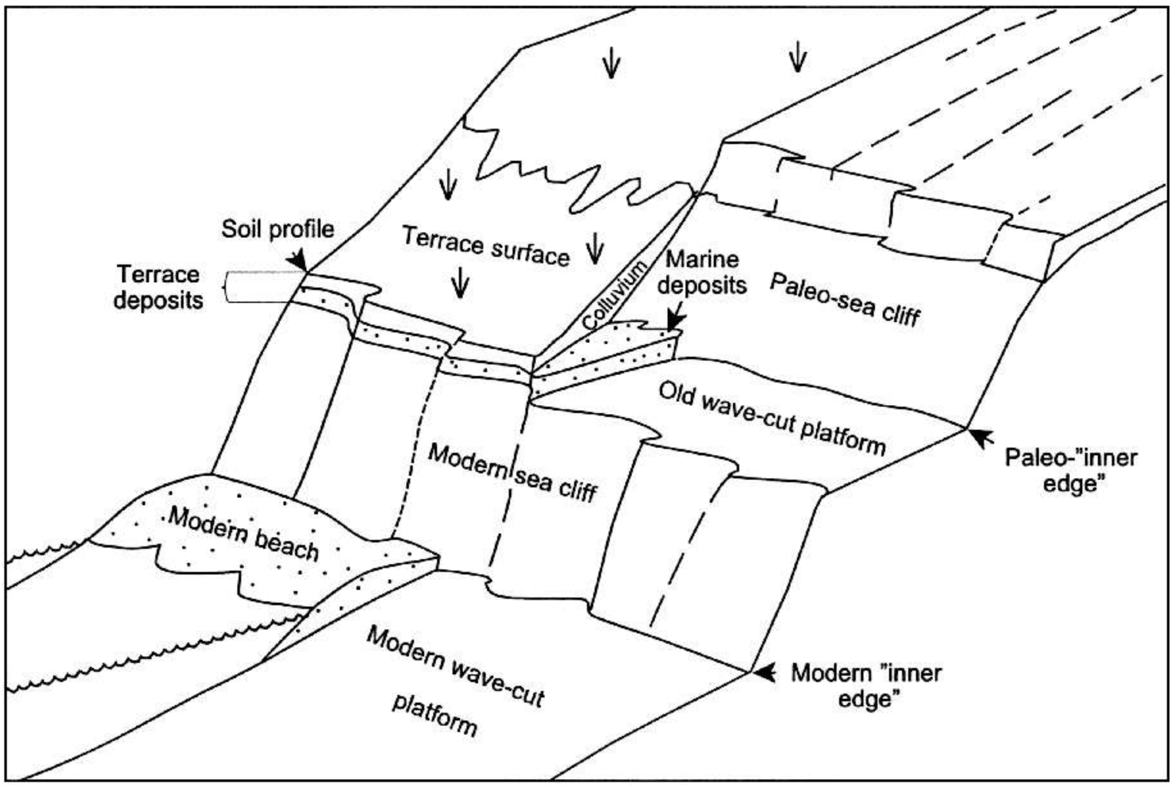

SOURCE: Drawing Adopted from Hanson and Others, 1990

FIGURE 3.1-4

Generalized Coastal Morphology

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seacliff and forms the modern wave-cut platform, it consists of grayish-green sandy claystone with resistant mollusk-bearing beds (*Ostrea idraensis*). It is gradationally overlain by the Torrey Sandstone (Kennedy, 1975).

A relatively localized area of the Del Mar Formation (on the beach just west of 645 West Circle Drive) contains brackish-water mollusks (Kennedy, 1975). Although they are relatively localized in the Del Mar Formation, they were also observed in the overlying Torrey Sandstone (Kennedy, 1975) in Solana Beach and in the Del Mar Formation (south of Solana Beach) in Del Mar and north San Diego. The areas in Solana Beach may be considered locally significant since they are easily accessible to parking areas and beach access, but these assemblages also occur elsewhere in the Solana Beach area and adjacent areas (Del Mar and San Diego).

Torrey Sandstone

The Torrey Sandstone of the La Jolla Group overlies the Delmar Formation and crops out continuously along the shoreline of Solana Beach. The contact between the Torrey Sandstone and the Delmar Formation is obscured by a seawall constructed at the bluff marking the northern part of the Solana Beach coastline. It consists of white to light brown, medium- to coarse-grained, massive to cross-bedded arkosic sandstone (Kennedy, 1975). Its age is established as middle Eocene (49 to 47 million years old) by the interfingering relationship with the overlying Ardath Shale observed in the area south of Torrey Pines State Park located south of the project study area. The Torrey Sandstone forms the seacliff (lower) portion of the bluffs.

Ancient River Channel Fill

Several old (post-Eocene to pre-late Pleistocene, 120,000 years old or older) stream valleys, cutting into the Torrey Sandstone bedrock and overlain by marine terrace deposits, are mapped in the study area. The deposits, recognized as channel fill were mapped at Tide Park by Kuhn, 1977. According to Kuhn (1977), the embayment feature at Tide Park and Ocean Street is approximately 110 feet in length and contains channel fill sediments primarily consisting of arkosic sands and gravels. At present, these deposits are obscured by the (pre-1973) concrete-bag seawall.

An ancient river channel observed at Fletcher Cove is filled with alluvial, colluvial/talus, and marine estuary sediments. During the 1977 investigation by Kuhn, approximately 300 feet of these deposits were exposed along the cliff and stabilized at their base by a concrete-gunite seawall.

Two other river channels are located underlying Del Mar Shores Terrace and the Del Mar Beach Club condominiums in the southern part of Solana Beach (Kuhn and Shepard, 1991).

Marine Terrace Deposits/Bay Point Formation

The marine terrace deposits unconformably overlying the Torrey Sandstone and the ancient river channel fill are well exposed and continuous in the study area. They are deposited on a wave-cut platform correlated by the majority of geologists with the Bay Point Formation, and by others with the Nestor Terrace, and are believed to be approximately 120,000 years old. Gaal and Kuhn (1985) pointed out that the age and correlation of this terrace are controversial and need to be determined by detailed mapping and dating techniques.

The published regional geologic maps show these deposits as undifferentiated marine and non-marine (colluvial), poorly consolidated deposits of late the Pleistocene-age (120,000 years old) Bay Point Formation composed of pale to reddish brown, fine- to medium-grained fossiliferous silty sandstone (Kennedy, 1975). Kuhn (1977) differentiates between basal marine deposits, which he describes as unconsolidated, laminated beach sands with pockets of fossil shell debris, and overlying non-marine deposits varying horizontally from wind deposited dune sands to alluvial sands and vertically to cemented soils (discussed below).

"Beach Ridge" Type Deposits

Iron oxide-cemented "beach ridge" residual clayey sand deposits may be observed in the upper bluff capping marine terrace deposits in several parts of Solana Beach. They were described during the field investigation by Group Delta (1998), and believed to be formed during a period of tropical to temperate climate associated with increased surface weathering, leaching, and precipitation of salts and minerals.

Gaal and Kuhn (1985) indicated that these deposits were locally overlain by sand dune deposits and soil zones, also locally cemented with iron oxide. Sand dunes could be observed on 1954 aerial photographs adjacent to farmlands, but were removed following the residential development in the 1970s.

Landslide Deposits

Landslides and blockfalls are two main types of the gravity-induced processes modifying the Solana Beach coastline. The occurrences of landslide and blockfall deposits are greatly related to the distribution of structural discontinuities (e.g., bedding planes, joints, faults). Landslide deposits in the study area are primarily rotational slump deposits associated with marine terrace deposits of the upper bluff. The blockfalls are typical of both the lower seacliff (rockfalls) and upper bluff. These deposits are episodical and may only be observed for a short period of time before they get washed offshore or redeposited as beach sediment. In July 2001, an approximately 100-foot-long blockfall of the lower bluff was observed in the area below 245 Pacific Avenue. Two areas of recent failures in the upper bluff material were observed below 327 and 357 Pacific Avenue in October 2001.

Beach Deposits

The modern beach deposits consist of unconsolidated silt, sand, gravel, and cobbles to a maximum dimension of 6 to 12 inches. In July 2001, beach sand was placed on the beach from dredging operations as part of the 2001 San Diego Regional Beach Sand Project (SANDAG, 2000b). Shingle (gravel and cobble) beach was observed during the site reconnaissance from

Seascape Surf (567 South Sierra Avenue) to Del Mar Shores Terrace (190 Del Mar Shores Terrace). Also, gravel and cobble deposits were observed at the base of the cliff below 629 West Circle Drive.

Artificial Fill

Compacted earth materials are encountered in the study area adjacent to the man-made structures, such as seawall backfill, geogrid slopes, parking areas, riprap, and revetments. They usually occupy relatively small areas along the coastline, except for the approximately 400-foot length of riprap below 190 Del Mar Shore Terrace.

Groundwater

Slight groundwater seepage was observed on the lower bluff face in the Torrey Sandstone in areas of siltstone layers and lenses in several caves in the northern part of Solana Beach in July 2001. Groundwater also is found at Fletcher Cove immediately adjacent and north of the existing stormwater discharge platform. No other areas of significant seepage were observed.

Groundwater is thought to be a main agent of subaerial erosion of coastal bluffs. Active subaerial erosion usually occurs in areas supporting a flow of groundwater along the contacts of lithologies of different permeabilities. Unlike in some other parts of the coast, the contact of the primary Solana Beach cliff-former, Torrey Sandstone, with the overlying bluff top terrace deposits, does not typically create a significant groundwater barrier. Subaerial processes may have played an additional part in erosion of the channel fill deposits discussed in the previous sections. Gaal and Kuhn (1985) indicated steady groundwater flow through the channel fill exiting as seepage at the cliff below Del Mar Shores Terrace and Del Mar Beach Club condominiums in 1976.

Groundwater flow in the lower sandstone cliffs occurs primarily along structural discontinuities and is an important factor in cliff stability. Artim (1985) reports that examination of rock falls after failure inevitably revealed the presence of water seepage near or at planes of failure.

The USACOE (1996) names the following as typical sources of groundwater: (1) natural groundwater migration from highland areas to the east of the terrace; and (2) infiltration of the terrace surface by rainfall, and by agricultural and residential irrigation water. Uncontrolled irrigation water causes a rise in the water table, and, especially if accompanied by uncontrolled surface runoff allowed to run over the bluff face, will promote slope failures and accelerate erosion of the upper bluff.

Seismicity

San Diego is in a highly active seismic region. The San Diego area has experienced mild earthquakes in recorded history, but none have been catastrophic. In 1964, three earthquakes of magnitude 3.5 had epicenter locations in San Diego Bay east of the Naval Amphibious Base (NAB) (City of Coronado, 1974). A magnitude 5.3 earthquake occurred 28 miles west of Solana

Beach on the Coronado Bank Fault in July 1986. With respect to local faults and fault zones, the Rose Canyon and Coronado Bank fault zones are designated by the California Department of Mines and Geology (CDMG) as active, and the La Nacion Fault has been designated as potentially active. Table 3.1-1 presents the seismic parameters and distances for faults most likely to affect the project area in terms of ground shaking. The most significant seismic event at the site would be an earthquake of Richter magnitude 7.0 associated with the Rose Canyon Fault Zone, which is approximately 2.5 miles west of the Solana Beach coastline. The regional fault map is presented in Figure 3.1-5.

Table 3.1-1
Seismic Parameters for Major Active and Potentially Active Faults Affecting Solana Beach

Fault	Distance from Fault to Project Area[1] (miles)	Maximum Credible Earthquake[1] (Richter Magnitude)	Estimated Peak Horizontal Ground Acceleration (g)[1]	Modified Mercalli Intensity[2]	Design Earthquake (g)[3]
Elsinore	30	7.5	0.11	X-XI	0.30
San Jacinto	54	7.0	0.03	X-XI	
San Andreas (creep section)	77	8.0	0.05	IX-X	
San Diego Trough	27	7.5	0.13	IX-X	
Coronado Bank	17	7.5	0.22	IX-X	
San Clemente	48	8.0	0.09	IX-X	
Rose Canyon	2.5	7.0	0.55	IX-X	
Newport-Inglewood (Offshore)	13	7.1	0.22	IX-X	
La Nacion[4]	13	6.5	0.17	IX-X	

[1] Blake, 1996.
[2] USGS, 1980.
[3] Blake, 1998. Based on ICBO, UBC, 1997, for the event with a 10 percent probability of being exceeded in 50 years.
[4] Considered to be potentially active.

3.1.2 Environmental Impacts

3.1.2.1 Significance Criteria and Methodology

This section focuses on potential geologic, seismic, and soils impacts on each of the project alternatives. Impacts of the alternative on the geologic environment would be considered significant if:

- Unique geologic features of unusual scientific value, for study or interpretation, would be adversely affected.

- Geologic processes such as major landsliding or erosion would be triggered or accelerated.

- Substantially adverse alteration of topography beyond that resulting from natural erosional and depositional processes would occur.

- Substantially adverse disruption, displacement, compaction, or overcovering of the soil would occur. Substantial irreversible disturbance of the soil materials at the location could cause their use for normal purposes in the area to be compromised.

Impacts of the following geohazards on the alternative would be considered significant if:

- Ground rupture occurs due to an earthquake or a known active fault, causing damage to structures, limiting their use due to safety considerations or physical conditions, or causing injury or death.

- Earthquake-induced ground shaking occurs causing liquefaction, settlement, or surface cracks at the location and attendant damage to proposed structures, causing a substantial loss of use or exposing the public to substantial risk of injury.

- Historic soil failure occurs due to liquefaction.

- Slope failure occurs on bluff areas that would become unstable on- or off-site as a result of the alternatives.

- Flooding caused by 100-year storm events combines with an extreme high tide or seismic sea wave that is capable of causing substantial damage to structures or exposing the public to substantial risk of injury.

- Seiches or tsunamis caused by nearby or distant earthquakes that are likely to occur in the lifetime of the alternatives are capable of causing substantial damage to structures or exposing the public to substantial risk of injury.

3.1.2.2 Impact Assessment

Alternative 1 – No Project - Continuation of Existing Policy

Continuation of the Shoreline and Coastal Bluff Protection Ordinance in the long term will likely result in armoring the entire natural coastal bluff with shoreline protection structures in Solana Beach, though the continued use of smaller structures such as notch fills and seacave fills would avoid the need for larger, more damaging seawalls, which would be more prevalent under Alternative 2, in which the City would repeal its Ordinance and leave the permitting of shoreline protective structures to the Coastal Commission. The intent of these structures is to reduce the potential for future significant landsliding, block falls, and erosion, thereby protecting private property and residential structures. The following presents the effects of protective devices on the coastline.

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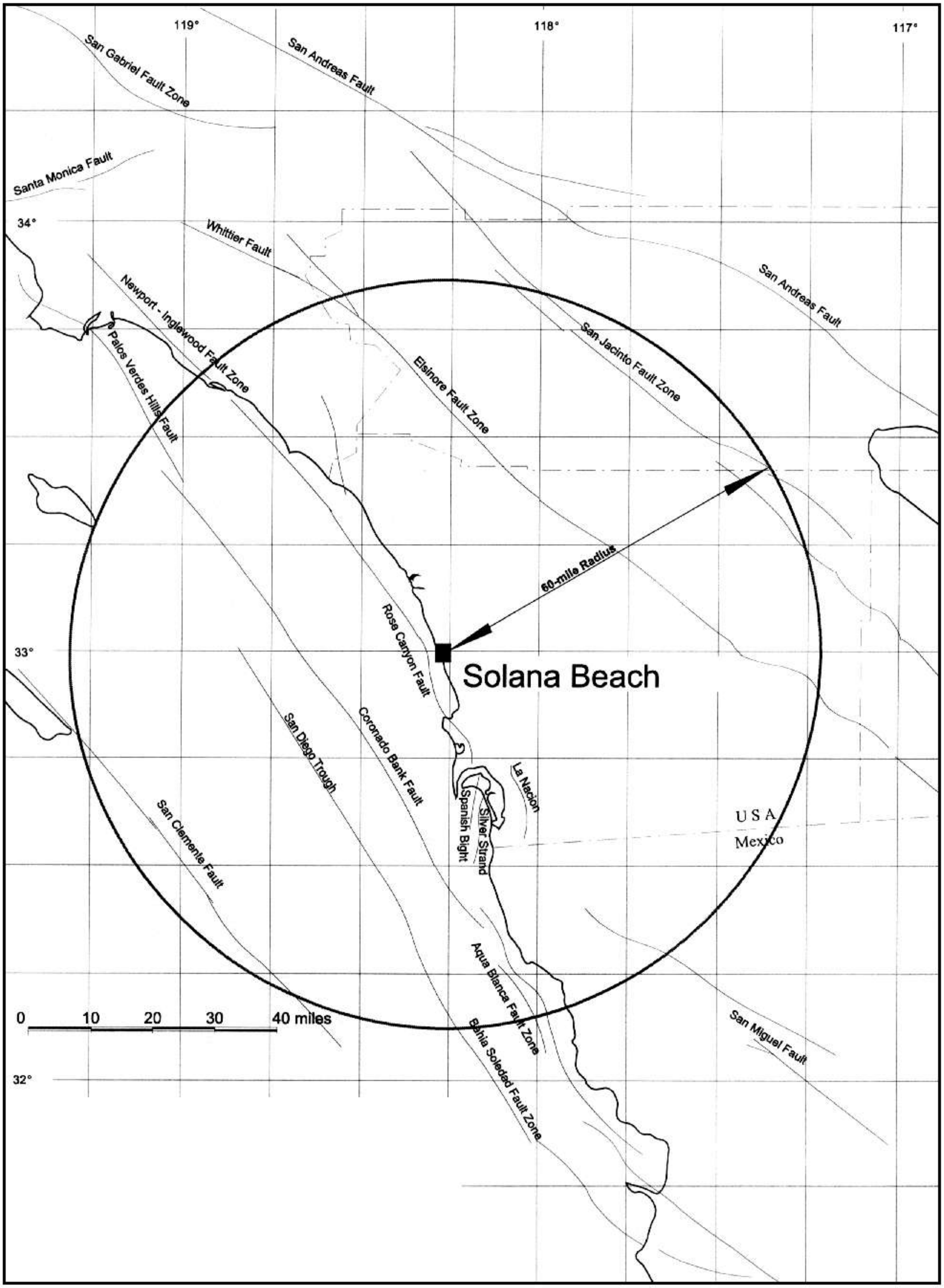

FIGURE

3.1-5

Regional Fault Map

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- *Seawalls*

Effects of Seawalls on Shoreline Erosion

The importance of understanding the influence of seawalls and other engineered protective structures on the dynamics of the shoreline is well recognized. The active urbanization along the southern California coastline brought about concern on the part of the coastal property developers and owners with the rates of cliff erosion and retreat, overall cliff stability, and possible mitigation options. The short-term rate of erosion accelerated following the severe El Nino storms of 1982-83 and 1997-98. As increased coastal erosion and cliff collapse jeopardized the existence of the upper bluff properties, a number of protective seawalls were constructed at the base of the coastal cliff. These seawalls prevented an immediate property loss, but were thought by some as having an adverse effect on the public beach. There was no documented evidence that seawalls caused beach or coastal bluff erosion.

The southern part of Solana Beach, especially areas underlain by the weakly consolidated material such as old alluvial channel deposits, faced the problems first, and several seawalls were constructed in the early 1970s and 1980s. The northern part, underlain by the more resistant sandstone bedrock exhibited extensive formation of seacaves primarily along joints and other planes of weakness. The infilling of seacaves and notches with erodible concrete constituted the major protective measure. The three seawalls constructed in the northern part of Solana Beach are Tide Park (1972), Mullen Wood (1992), and Colton (2000). Most of the seawalls south of Fletcher Cove were built prior to 1980.

Effects of Seawalls on Beaches

Although understanding the effects of seawalls on beaches is important, it should be kept in mind that the majority of seawalls were designed for the purpose of protecting landward structures from erosion, and not for protecting the beaches.

Interactions of the beaches and seawalls remain the subject of debate in the scientific community, and there are very few long-term quantitative field studies available that document these interactions. The majority of these types of studies include field observations over a relatively short period of time and lack sufficient data on long-term effects of waves, beach profiles, and shore configuration (Kraus, 1987; Wiegel, 2000). Dr. Wiegel (2000) reports only two well-documented and complete field studies (Griggs and others, 1994; Basco and others, 1994). A third study began in 1993 on Duck Lake, Michigan. This study has not been completed and is not specifically relevant to the subject case (due to unsimilar conditions).

The better-documented field studies conclude that seawalls, in general, do not cause long-term beach erosion, except for special circumstances, such as the prevention of the erosion of dunes or sandy bluffs that supply downdrift beaches, or acting as a groin with resulting shoreline updrift and recession downdrift (Dean, 1987; Wiegel, 2000). Dr. Wiegel (2000) pointed out that comparisons of beaches with structures and beaches without structures often led to a conclusion that both types of beaches went through the same cycle of erosion and deposition under control of wave conditions offshore with no appreciable affect of structure. In the majority of cases, seawalls are constructed to protect structures landward from erosion due to other causes and, therefore, are located in areas where erosion is already occurring. As a result, erosional features may be observed adjacent to seawalls, but they do not justify the conclusion that seawalls cause erosion.

According to the Committee on Coastal Erosion Zone Management (CCEZM, 1990; Wiegel, 2000), properly engineered seawalls and revetments can protect the land behind them without causing adverse effects to the fronting beaches. Proper design, construction, and maintenance of seawalls and revetments are emphasized, for improperly constructed seawalls may, indeed, cause adverse impacts on adjacent property. It is often for these impacts that seawalls in general get blamed for causing erosion. At the same time, the role of seawall design (especially the role of permeability of the wall itself) is not completely understood (Tait and Griggs, 1991) and further studies are recommended.

Although field observations may be compared at different sites and different shorelines, and generalized conclusions may be made, the evaluation of the impact of seawalls on beaches remains site specific. Coastal processes in general are the same, but wave climates, beach profile dynamics, shoreline configuration, etc. vary from site to site.

Two previously mentioned detailed studies allowed the evaluation of general and site-specific impacts of seawalls on the Monterey Bay beaches with no long-term erosion (Griggs and others, 1994), and on the progressively eroding beaches of the southern Atlantic Coast of Virginia (Basco and others, 1994; Wiegel, 2000). In both studies, beach profiles at beaches with seawalls, and at beaches without seawalls (control beaches) were periodically surveyed, along with the other data collected. Tait and Griggs (1991) provided a very thorough overview of the beach responses to the presence of a seawall, both observed in the field, and hypothetical (predicted, but not documented in the field), along with the processes and controls thought to cause these responses.

It is very clear that response of the beach to the presence of a seawall is site specific and should be studied as such. However, in the absence of detailed studies in the Solana Beach area, some of the observations and conclusions of Griggs and others (1994) may be cautiously utilized.

Short-term Effects

The majority of the field studies indicate that most of the direct effects of seawalls on beaches are short term, or seasonal. The impact of seawalls on beaches is generally remedied during the recovery phase (see Tait and Griggs, 1991, for the list of references). However, each situation is unique, and seawall effects that proved to be seasonal at some sites, were observed to be irreversible at the others. The following effects were observed at a variety of sites:

End scour, or "flanking" is the most often observed seawall effect. It is manifested in accelerated erosion and lowering of the beach adjacent to the side ends of the protective structure, especially at the downdrift ends. This effect is reported at the shores backed by erodible dunes or bluffs. In some cases the end scour effect is primarily due to the seaward location of the seawall on the beach profiles, e.g., projecting into the surf zone and obstructing the longshore sediment transport. In the other instances, it may be caused by wave reflection from the return or end walls (Tait and Griggs, 1991). This is also addressed under long-term effects.

Scour trough formation was reported both on unprotected beaches and protected beaches, in front of seawalls, subsequent to hurricanes in South Carolina and Florida. The beach recovery results were variable, and no clear conclusions on the impact of the seawalls on the beach recovery process could be drawn. No similar troughs were observed in response to storms in California (Tait and Griggs 1991).

Deflated (flat) profiles, or lowering of the beach elevations in front of seawalls, were observed by Griggs and others (1997) during erosive winter season in response to the interaction of waves with seawalls. This effect is similar to scour trough, except that it is not hurricane induced, but rather limited to the duration of the winter erosional phase.

Beach cusps were also observed by Griggs and others (1997) in front of seawalls and appeared to correspond with the formation of deflated profiles.

Sand accretion is sometimes observed when the wall is projected into the surf zone (due to long-term erosion, seasonal beach width fluctuation, or in response to a storm) and interrupts the longshore sediment transport, acting as a groin. The wider beach may be formed updrift of the wall, with the narrowing of the beach downdrift.

It is unlikely that any of the short-term effects would be associated with the seawall constructed at the base of the relatively resistant cliffs in Solana Beach. Deflated profiles may be observed adjacent to both unprotected and protected cliffs, as the beach narrows or disappears, and the gradient of the beach profile may increase. Therefore, short-term effects of shoreline protection structures such as those allowed under the Shoreline and Coastal Bluff Protection Ordinance are considered less than significant.

Long-term Effects

Tait and Griggs (1991) and Griggs and others (1994) concluded that whereas the single most important factor in evaluating the potential effects of seawall construction on beach erosion is whether or not the shoreline is undergoing a net long-term retreat, geomorphic shore type plays a role in the impact of stabilizing a shoreline undergoing net retreat (such as the Solana Beach shoreline) (Tait and Griggs, 1991). It has been long recognized by coastal engineers that the position of the seawall on the beach profile, and relative to the surf zone, is very important (Wiegel, 2000). The best location for the seawall is at the back of the beach where it protects against the largest storms (Tait and Griggs, 1991). Tait and Griggs (1991) conclude that construction of the seawall at the base of a cliff made of relatively resistant rock has little net effect on beach erosion (Figure 3.1-6). Based on cliff retreat studies (AMEC, 2001), it was concluded that in Solana Beach, seacliff materials are relatively resistant, and their erosion is a minor source of the beach sand. Therefore, the long-term effects of the seawall on the beach would be very similar to the effects of the seacliff on the beach: limiting beach retreat and causing the decrease of the beach width, until full disappearance of the beach (this effect may be mitigated by an increase in the sand supply, e.g., through beach nourishment). If the seawall is more resistant than the seacliff, it will form a small headland over time (Tait and Griggs, 1991).

Long-term effects of seawalls on beaches were summarized by SANDAG (1992) and Flick (2001) as follows:

- Long-term Loss of Beach Width. Seacliff protective structures are used to halt seacliff erosion. Seawalls fix the base of the seacliff and, hence, the back boundary of the beach. So long as the shoreline is experiencing a net retreat, a net sea level rise, or natural seacliff retreat, the width of the beach will decrease with the construction of a protective structure through this process called "passive erosion" (Figure 3.1-6). Where the pre-storm width of the fronting beach is less than about 200 feet, unprotected seacliffs will be scoured at their base occasionally by storm waves in the San Diego area.

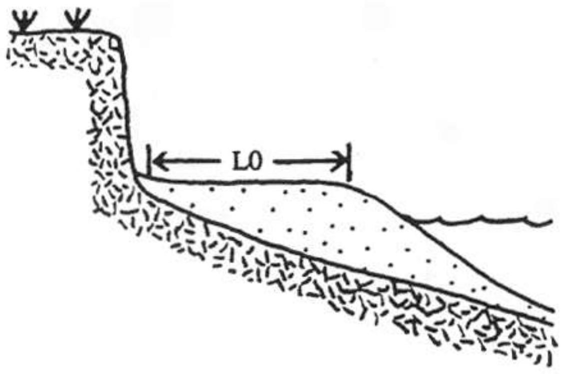
- Reduction in Sediment Contribution to the Littoral Zone. Seacliff erosion supplies coarse sand to the beach. Construction of protective devices reduces this contribution. The amount of sediment reduction that these devices cause is a function of the height of the seacliff, the retreat rate, the length of the seacliff that will be protected by the device, and the percent sand and coarser material in the geologic unit that is released during erosion. In summary, Dr. Flick (2001) indicates that the contribution of the Solana Beach cliffs to the sand in the littoral cell ranges from 1 to 6 cubic yards per yard of beach. Assuming an average of 3.5 cubic yards per yard of coast yields less than 10,472 cubic yards of sand contributed by the Solana Beach coastline per year, this equates to less than 1 percent of the gross longshore sand transport potential for the entire littoral cell.

- Beach Encroachment/Placement of the Protective Structure. A protective structure constructed seaward of the base of the seacliff has both a static and dynamic effect on the fronting beach. The static effect is the reduction in beach width that occurs at the time of construction because the landward boundary of the beach is moved seaward. Since typical seawalls and notch in-fills are placed against the existing bluff, the loss is usually on the order of a few feet. The dynamic effect is the progressive reduction in beach width that occurs in front of a seawall or revetment when the shoreline is retreating, similar to what occurs when the back boundary of the beach is fixed (as stated above).

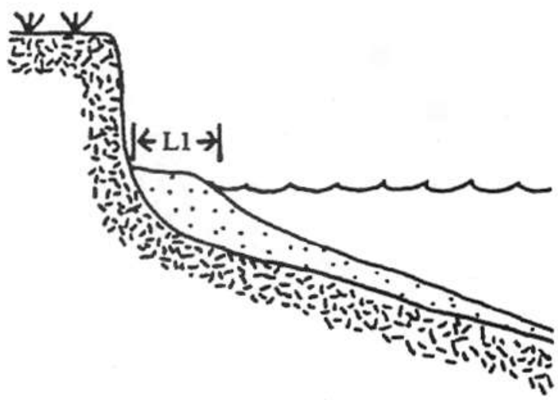
- Wave Reflection. Reflective wave energy from a protective structure may result in the seaward transport of sand (to below sea level), thereby reducing mean beach width (over the long term) of a narrow beach. This reflection is not unlike the reflection provided by the existing lower bluff material.

Case II: Resistant Seacliff, Sediment Deficiency and Sea Level Rise, Wall at Base of Cliff.

Initial Shore Profile

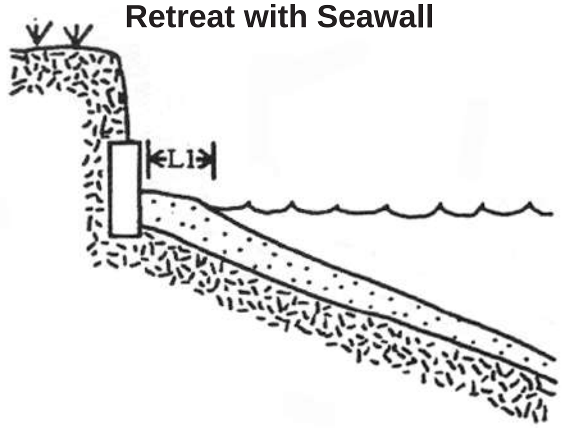


Shore Profile after Shoreline Retreat



Shoreline migrates landward and beach narrows because seacliff limits beach retreat (L1 <L0).

Shore Profile after Shoreline Retreat with Seawall



Seawall has approximately the same effect on the beach as would the seacliff (L1 <L0). If the wall is more resistant than the seacliff, the seawall could become a small headland over time. If the shoreline is stable or advancing, the wall has little effect.

SOURCE: Adapted from Tait and Griggs, 1991

FIGURE 3.1-6

Long-term Effects of a Seawall on a Retreating Shore

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- Erosion of Tidal Terrace. If bluff retreat is fixed by a seawall, new tidal terrace is not formed and it may be possible that the existing tidal terrace may be eroded to a level below mean tidal levels. If the protective sand is eroded away due to a storm or long-term sand depletion, the eroded tidal terrace may not provide a dry surface for public access, may cause an increase in bluff instability, and cause an increase in the potential for erosion of the lower bluffs due to the impact of higher energy waves. The erosion of the tidal terrace is not considered geologically significant, due to the actual loss of the resource alone, but may be considered significant since the loss of the resource may cause an acceleration in erosion and a substantial adverse alteration of topography beyond that resulting from natural erosional and depositional processes.

- Discontinuous Protection Effects. When continuous protection is not provided over the entire length of an exposed seacliff, at least one technical report (SANDAG, 1992, Page 21) indicates that unprotected adjacent property may experience a greater retreat/erosion rate (due to short-term effects presented earlier such as end scour or "flanking", scour trough formation, beach cusps, etc.) than would occur if the protective device were absent.

- End Scour. End scour or "flanking" has been recognized as one of the negative features associated with seawalls. It has been recognized by engineers and has been documented (although not in sufficient detail) in the literature. One of the interesting aspects of such scour is the distinctive "crescent" shape it typically exhibits. Tait and Griggs (1991) summarize six seawall studies and notes that end scour was observed in five of the six cases studied. In addition, as noted in Tait and Griggs (1991), studies by McDougal and others (1987) indicate that the magnitude of end scour increases with the length of the seawall. Several small-scale model tests indicate that the downcoast extent of end scour is about 70 percent of the wall length while field observations indicate that the length of end scour ranges from 10 to 50 percent of the seawall length. Griggs and Tait (1988) note that the distance the wall extends into the surf zone may be a more relevant factor than wall length if end scour is associated with up coast sand impoundment or the "groin effect."

Seawall Design Effects on Beach Response

The role of seawall design as a controlling factor in beach response is not thoroughly understood. In their review, Tait and Griggs (1991) note that the less reflective (sloping or containing riprap apron at the toe, rough-surfaced, and permeable) seawalls should dissipate more incident wave energy, and produce less scour, than more reflective (vertical, smooth, impermeable) walls. It also may be true that the significance of the reflectivity of the seawalls varies depending on the wave regime. Wiegel (2000) found no evidence that more permeable stone revetments have fewer effects on the beaches than seawalls. The amount of scour seems to increase proportionally with the increase of the seawall length. However, it is generally accepted that the position of the seawall on the beach profile and the extent it projects into the surf zone plays a far greater role than its length (AMEC 2001).

Effects of Seawalls on Coastal Upper Bluffs

No documented studies by recognized experts discussing the effects of seawalls on adjacent portions of the upper bluff were found. Based on the understanding of the relationship between the seacliff and upper bluff erosion, it can be deduced that protection of the seacliff from undercutting by wave action (by construction of seawalls) will decrease the number of upper bluff slope failures due to the mass wasting processes (slides and slumps) and, thus, decrease short-term erosion. The long-term erosional rate of the upper bluffs is thought to be equal to the long-term rate of the lower seacliffs.

- *Seacave Plugs and Fills*

Effects of Plugs and Fills on Shoreline Erosion and Beaches

There is no evidence that indicates that seacave plugs and fills contribute to shoreline and beach erosion. Non-erodible and erodible seacave plugs and fills constitute major cost-effective protective measures, which reduce erosion of the cliff base and improve the overall stability of the bluffs. Plugs and fills would reduce the need to construct seawalls providing there is construction access and there are no site constraints such as locations where there is no beach.

Short-term Effects

No short-term effects to geology and soils would result from the plugging or filling of seacaves of the relatively resistant cliffs in Solana Beach. The plugging or filling of seacaves and notches with erodible concrete reduces the potential for near-term catastrophic failures, but the erosion still occurs at the same rate and, with enough passage of time, erodible and non-erodible concrete would have the same long-term effect. In the short-term, both non-erodible and erodible plugs and fills would reduce the need of constructing a more intrusive and costlier protection device such as a seawall.

Long-term Effects

No-long-term effects to geology and soils would result from the plugging or filling of seacaves. In the long-term (100+ years), both non-erodible and erodible plugs and fills will result in the ultimate landward erosion of the bluffs. The rate of landward erosion will depend upon varying factors such as the beach width, cliff strength, and unpredictability of wave and tide conditions. However, continuation of the Shoreline and Costal Bluff Protection Ordinance reduces the otherwise seemingly inevitable need for massive seawalls by as much as 50 to 100 years. This continued reliance on less intrusive structures should allow time for federal and state agencies to accumulate funds and prepare the necessary studies for sand replenishment programs and to construct offshore structures if they are deemed appropriate.

Effects of Plugs and Fills on Coastal Upper Bluffs

No negative effects on coastal upper bluffs would result from the plugging or filling of seacaves. The plugging or filling of seacaves reduces the effects of wave and tide energy on the existing notches; therefore, reducing the potential failure of the upper bluffs in the short-term. In the long-term (100+ years), both non-erodible and erodible plugs and fills will result in the ultimate landward erosion of the bluffs. The rate of landward erosion will depend upon varying factors such as the beach width, cliff strength, and unpredictability of wave and tide conditions, as well as foot traffic, rodent activity, quantity and timing or irrigation/precipitation events, groundwater, surface water flows, faults, seismic events, etc. A thorough analysis of the site specific and surrounding environment will have to be compiled to further evaluate all the geologic factors that provide design input on a particular project. The listed factors all may have a significant negative effect of upper bluff stability and should be carefully evaluated prior to final design.

- *Revetments*

Effects of Revetments on Shoreline Erosion and Beaches

There is no evidence that indicates that revetments contribute to shoreline and beach erosion. Revetments are flexible and cost-effective protective devices, which reduce erosion of the cliff base and improve the overall stability of the bluffs. Revetments could help reduce the need to construct seawalls providing there is construction access and there are no site constraints such as locations where there is no beach.

Short-term Effects

No short-term effects to geology and soils would result from the construction of revetments at the cliff base. In the short-term, revetments would reduce the need of constructing a more intrusive and costlier protection device such as a seawall.

Long-term Effects

No-long-term effects to geology and soils would result from the construction of revetments. In the long-term (100+ years) with or without revetments, the ultimate landward erosion of the bluffs is inevitable. The rate of landward erosion will depend upon varying factors such as the beach width, cliff strength, and unpredictability of wave and tide conditions.

Effects of Revetments on Coastal Upper Bluffs

No negative effects on coastal upper bluffs would result from the construction of revetments. Revetments reduce the affects of wave and tide energy on the existing notches; therefore, reducing the potential failure of the upper bluffs in the short-term.

- *Cobble Berms*

Effects of Cobble Berms on Shoreline Erosion and Beaches

There is no evidence that indicates that cobble berms contribute to shoreline and beach erosion. Cobble berms constitute a non-conventional and cost-effective approach to address the seacliff erosion problem. Cobble berms would reduce the need to construct seawalls, providing there is construction access and there are no site constraints such as locations where there is no beach.

Short-term Effects

No short-term effects to geology and soils would result from the construction of cobble berms at the cliff base. In the short-term, cobble berms would reduce the need of constructing a more intrusive and costlier protection device such as a seawall.

Long-term Effects

No-long-term effects to geology and soils would result from the construction of cobble berms. In the long-term (100+ years) with or without cobble berms, the ultimate landward erosion of the bluffs is inevitable. The rate of landward erosion will depend upon varying factors such as the beach width, cliff strength, and unpredictability of wave and tide conditions.

Effects of Cobble Berms on Coastal Upper Bluffs

No negative effects on coastal upper bluffs would result from the construction of cobble berms. Cobble berms reduce the effects of wave and tide energy on the existing notches, therefore reducing the potential failure of the upper bluffs in the short-term.

Summary

A known fossil bed exists immediately adjacent to an existing seawall in front of 637 Circle Drive on State property in Cardiff State Beach, north of the City of Solana Beach. The fossil beds were not damaged during construction of the seawall and are used periodically for university field trips as examples of local fossils. Protective structures will not significantly cause major landsliding or erosion nor substantially alter the existing topography. The majority of short-term and long-term effects are not considered significant. However, the long-term loss of beach width and end scour effects of a completely armored coastline are considered significant. The overall “geologic character” of the lower bluff (seacaves, seepage areas, concretions, cross-bedding, geologic structure, etc.) would be adversely affected and covered from view.

Impacts of geohazards (seismicity, fault rupture, liquefaction, settlement, etc.) on shoreline protection structures or on public safety would be less than significant because they would be mitigated by the project design as discussed below. Future seawalls and other protective structures would not be adversely affected by soil liquefaction if they are properly engineered and founded into formational materials. The potential for ground rupture is not considered significant. The walls should be properly designed for flooding and tsunami effects. Shoreline protective devices are designed to consider the potential for slope instability and these devices should reduce the potential for future soil erosion or landsliding by reducing the undercutting or "notching" of the Torrey Sandstone. This reduces the potential for failure of the overlying terrace materials that may eventually adversely affect the residential structures or other bluff top improvements, and public safety. The effects of significant geohazards will be mitigated by design of the shoreline protective structures in accordance with the current standard of care in the industry, the standards of the Structural Engineers Association of California, and the latest edition of the Uniform Building Code (which specifies a seismic design to withstand an earthquake event that has a 10 percent probability of exceedence in 50 years).

Continuation of the Shoreline and Coastal Bluff Protection Ordinance promotes the implementation of seacave plugging and filling over the construction of seawalls, bluff retaining walls, gunite covering, and similar permanent armoring for shoreline protection. This alternative, therefore, reduces the long-term geologic and soils impacts associated with armoring the entire coastal bluff and as discussed above. The City's Shoreline and Coastal Bluff Protection Ordinance takes a more proactive approach in reducing erosion of the bluffs and minimizes effects that could result in a future need to construct a more intrusive device.

The City's Shoreline and Coastal Bluff Protection Ordinance imposes setbacks and blufftop erosion management measures such as irrigation controls, restrictions on grading of bluff tops, and seacliff faces and restrictions on drainage over bluff tops and seacliff faces as follows:

- Place shoreline defense structures at the most feasible landward location.
- Use native vegetation that requires minimum watering.
- Lawns and similar ground cover are permitted but are subject to strict watering requirements.
- Landscape standards shall discourage work on the bluff face.
- Automatic irrigation systems shall be prohibited within 100 feet of the coastal bluff unless the systems incorporate automatic shut-off valves and moisture sensors.
- Retrofit with drip, mist and other very low flow irrigation devices of irrigation systems on the bluff or within 25 feet of the bluff top edge.
- Drainage over the bluff edge or through the bluff shall be prohibited unless the water is contained within a pipe drainage system approved by the City Engineer.

In addition, the City's ordinance requires that wall designs address wave reflection. The Ordinance requires that wall design should consider the surface characteristics of the seacliff and of the protective structure (slope and surface roughness), and the locations of the seacliff and seacliff protective structure relative to each other, to mitigate the negative effects of wave reflection from protective devices. Sand loss impacts from wall reflection aspects not mitigated through design can be mitigated through sand banking in coordination with the mitigation of other consequences (see below).

Mitigation

Continuation of this policy, in the long-term, will likely result in armoring the entire natural coastal bluff with shoreline protection structures in Solana Beach. To address such a prospect, described below are additional "mitigation measures" that, if implemented by the City and/or other governmental agencies, might reduce or avoid the long-term need for total coastal armoring. It is important to understand, however, that under Alternative 1, the City would not be taking any action, but instead would be leaving its existing Ordinance in place. As a result, the City would not be "approving" any "project" with "significant environmental effects" for which "mitigation measures" must be adopted if "feasible." In other words, in the unique situation facing the City, standard CEQA terms – "environmental impacts" and "mitigation" – do not accurately convey the true nature of the consequences of Alternative 1. Because the City would not be taking any action, the City would not be subject to the CEQA statutory mandate requiring that the approval of a project with significant effects necessitates the approval of any "feasible" mitigation measures addressing such impacts. (See Pub. Resources Code, § 21002.) The City would therefore have unfettered discretion to decide whether to undertake, either on its own or in tandem with other agencies, any "mitigation measures" recommended in this MEIR. The City Council might choose to pursue some of the measures listed below, but cannot be compelled to do so even if it were shown that they are "feasible" within the meaning of CEQA.

Long-term Loss of Beach Width. This can be mitigated using artificial beach replenishment provided the program is properly designed to maintain a protective beach width in front of the structures.

Reduction in Sediment Contribution to the Littoral Zone. This can be mitigated in a similar fashion as the loss of beach by using artificial beach replenishment.

Beach Encroachment/Placement of the Protective Structure. This can be mitigated by locating the protective structure as close as possible to the base of the seacliff. The dynamic effect can be mitigated in a similar fashion as above, by artificial beach replenishment. The City's Shoreline and Coastal Bluff Protection Ordinance currently contains a finding that any approved structure be placed at the "most feasible landward location [(SBMC 17.62.080(A) (6) (d)].

Effect of Discontinuous Protection. Since long-term conditions will likely result in complete, continuous coastal armoring, there will be no significant adverse effects of discontinuous protection.

End Scour. Although no mitigation has been set forth in the scientific literature, it seems apparent that if the coastline were armored along the total length of beach, end scour (within the City limits) would not be significant and, thus, no mitigation would be necessary. End scour would be likely at the downcoast end of the wall, however. End scour would most likely be mitigated by construction of an additional protective seawall downcoast, the construction of a riprap revetment at the end of the subject seawall, or by a combination of sand replenishment and/or a groin system.

Alternative 2 – Repeal of the Shoreline and Coastal Bluff Protection Ordinance

The effects of seawalls, seacave plugs and fills, revetments, and cobble berms would be similar to those listed under Alternative 1 above. However, this alternative would result in higher short-term impacts, as the repeal of the City's Shoreline and Coastal Bluff Protection Ordinance could result in a higher rate of bluff erosion and cliff failures because shoreline and bluff protection devices would no longer be reviewed and permitted by the City of Solana Beach, which takes a more proactive approach than the Coastal Commission has traditionally employed in reducing shoreline and bluff erosion. Under the California Coastal Act (Pub. Resources Code, § 30235), property owners have to demonstrate that the home is threatened before the Coastal Commission will issue a permit; and by the time a home is threatened, a seawall is usually the only device that can protect the bluff from failure.

The long-term effects of this alternative would be somewhat similar to Alternative 1, above with one exception. Alternative 2 would not promote the implementation of seacave plugging and filling over the construction of seawalls, bluff retaining walls, gunite covering, and similar permanent armoring for shoreline protection. Alternative 2, therefore, would increase the long-term geologic and soils impacts associated with armoring the entire coastal bluff, as discussed above. Future approvals for shoreline protection would not be reviewed by the City under its current ordinance, which prefers seacave plugging and filling; therefore, approval of shoreline protection would proceed directly to the California Coastal Commission and would likely result in armoring the entire natural coastal bluff with armoring. The City of Solana Beach could encourage the California Coastal Commission to revise its current policy and take a more proactive approach to coastal bluff protection similar to that found in the City's Ordinance, which helps to reduce the impacts of seawalls. However, since California Coastal Commission policy changes are out of the control of the City of Solana Beach, this would not be a feasible mitigation measure as far as the City is concerned, though the Commission would be free to implement a more proactive approach than it has used in the past.

Mitigation

The long-term effects of this alternative would be similar to those of Alternative 1; thus, the mitigation would also be similar to Alternative 1. It is important to remember, however, the nature of the action that would be taken pursuant to Alternative 2. The City would be repealing its existing Ordinance while leaving the Coastal Commission still subject to Coastal Act requirements mandating the issuance of permits for coastal protective structures in some instances. Under such a scenario, the City's action would not be the sole, or even the dominant, cause of any continuing negative consequences associated with the continuing approvals of shoreline protection structures, as the Coastal Commission would continue to approve such structures. Thus, as with Alternative 1, the City would have broad discretion as to whether to undertake any role in carrying out policies that might mitigate the effects of continuing Coastal Commission approvals.

<u>Alternative 3 – Sand Replenishment and Retention Program</u>

Sand replenishment alone would not adversely affect unique geologic features; would aid in slope stability and reduce erosion effects of waves; would provide a 200 foot beach width to significantly reduce the potential for waves to adversely impact the lower bluff; and would not cause significant disruption, displacement, compaction, or overcovering of the soil. As such, if properly implemented, this alternative would have less than significant negative impacts. Beach replenishment using dredged sediments is generally considered a beneficial use in areas where beach erosion is a problem as the fill can be utilized to create a sand berm to provide additional recreational uses and shoreline protection. However, placement of the sand can also create a temporary change in the shoreline. Over a period of time, from 6 months to 2 years, the sand would be moved and redistributed from the placement location along shore and cross-shore through natural littoral transport. At that time, the shoreline would again reach an equilibrium position, which would be very similar to the existing beach profile. The shoreline would temporarily widen at locations up coast and downcoast of the beachfill site, until natural littoral transport redistributed the sand along the coast. Sand replenishment alone is not anticipated to significantly impact the littoral process.

Sand replenishment is anticipated to be performed in conjunction with a sand retention system to increase the long-term effects of sand replenishment. Construction of jetties, groins, reefs, breakwaters, or other sand retention devices (SANDAG, 2001b) that would be constructed to aid in retaining the sand in the area of beach replenishment would not have significant negative impacts on the geologic environment. Artificial sand retention devices such as breakwaters and reefs would impound sand behind the structure. Groin fields could cause potential downcoast erosion since the littoral drift is interrupted, resulting in significant impacts (SANDAG 2001b). These structures could cause damage to existing reefs and disrupt surfing breaks.

This alternative would not be significantly impacted by geohazards such as ground rupture, earthquake shaking, slope failure, flooding, or tsunamis. On the contrary, sand replenishment would aid slope stability, reduce bluff/soil erosion, reduce tsunami effects, and reduce the potential for slope failures by reducing erosion at the bluff toe and thus reducing erosion of the overlying terrace materials.

Because the littoral processes within the Oceanside Littoral Cell dominate a large region of the coast, any changes to beaches in the vicinity of Solana Beach would be relatively insignificant to the entire cell. Previous placement of fills on the beach in Oceanside have not shown dramatic changes in the littoral process. Since 1955, over 13,000,000 cubic yards of fill have been placed onshore or nearshore in Oceanside by the USACOE with no adverse impacts having been recorded (U.S. Department of the Navy, 1997). A sand berm would be expected to form in the shallow subtidal area as a result of sediment transported into this zone, which would likely improve surf break conditions. Scarping could occur during times of high waves. This could cause minor changes in wave breaking characteristics and slightly increased wave energy reflection during times of low waves (approximately 2 to 3 feet or less). However, this change would be negligible and considered insignificant. In addition, sand deposition is not expected to affect existing reef breaks in the area. Significant impacts to littoral processes would be anticipated to occur as a result of this alternative.

Mitigation

Mitigation measures to offset the impoundment of sand behind breakwaters and reefs would include pre-filling the area behind the retention structure (salient volume) with sand imported from outside of the littoral system. Pre-filling the groin field, extending sand bypassing, regular beach monitoring, and possible sand replenishment would mitigate downcoast erosion caused by groin fields.

<u>Alternative 4 – Planned Coastal Retreat</u>

An assessment of the rates of the coastal erosion along the southern California coastline in general, and along the Solana Beach segment in particular, is a very complex task. The rates vary greatly along the coast, depending upon the variety of natural geological and hydrological, oceanographic, meteorological/climatic, and other processes operating in the natural (prior to development) coastal environments. Furthermore, in highly developed coastal San Diego County they are greatly influenced by anthropogenic (man-induced) factors, such as construction of the structures interfering with the sand supply, over-irrigation and improper drainage, disturbance of the natural soil and vegetation cover, and others. The southern portion of the Solana Beach coastline is especially heavily developed with high-density condominium complexes built during the 1970s. Some of the condominiums constructed prior to Proposition 20 of the California Coastal Zone Conservation Initiative of 1972 were built as close as 5 feet from the edge of the bluff.

After 1972, when geologic reports became a requirement prior to the development of the coastal areas, retreat data reported for the coastal San Diego County are controversial and incomplete. The low quality data were often attributed to the lack of understanding of the processes causing the erosion, as well as the bias on part of the private consultants favoring a certain point of view (Gayman, 1985).

Very few scientific studies with the objective of measuring erosion rates were conducted in the area. In 1983, the National Ocean Survey (NOS) section of the National Oceanic and Atmospheric Administration (NOAA) conducted a study of the southern California coastline based on detailed cartographic data over the past 100 to 130 years. Unfortunately, the produced maps were too controversial. Part of the problem was in plotting errors, lack of adjustments for seasonal changes, and errors in elevations. In some areas, the shoreline known to be erosional (losing sand) was interpreted to be accretionary (gaining sand) based on NOS data.

In 1994, the state-of-the art softcopy photogrammetric and geographic information system (GIS) imaging laboratory (Coastal Geology and Imaging Laboratory, CGIL) at University of California Santa Cruz (UCSC), funded by the Federal Emergency Management Agency (FEMA), used high-precision mapping techniques to determine accurate long-term recession rates along the San Diego County coastline by eliminating mapping errors (Benumof and Griggs, 1999). A mean bluff recession rate for the Solana Beach segment was reported to range from 0.19 to 0.36 feet per year.

It is important to understand the mechanics of the coastal erosion to accurately evaluate its rate. As it was discussed in the previous section, a typical Solana Beach seacliff is formed primarily by two geologic formations: Torrey sandstone in its lower part, and the Bay Point Formation terrace deposits comprising its upper part, or bluff. Retreat of the resistant lower cliff occurs mainly due to the wave action and marine erosion. Erosion of the relatively soft Bay Point Formation, which lies generally beyond the reach of wave action, is caused primarily by subaerial and other non-marine processes. The edge of the bluff thus recedes significantly due to the change of the upper-bluff slope angle from an original 60° to 90° slope to an approximately 35° slope. This retreat is significant, episodic, and often incorrectly attributed to marine processes.

It is necessary to make a distinction between short-term (historical, cyclic) and long-term (geologic, chronic), and site-specific and average, rates of erosion. Most often reported short-term rates vary from 0 to 1.3 feet per year for the California coastline (Gayman, 1985). High rates of erosion are generally reported in the areas of seacaves, where the nature of erosion is episodic and its short-term rate is extremely high for the narrow zone of the collapsed cave. The average rate of erosion would vary greatly depending on a percent of the shoreline occupied by, for instance, seacaves or less resistant formations. The rates tend to increase greatly following heavy winter storms, such as the 1982-83 El Nino episodes (being 100-year events according to USACOE estimates). In 1970, a seacliff base recession study was conducted along a 21-mile segment of coastline from Leucadia to Point Loma (Artim, 1985). A total of 93 monuments were monitored from 1970 to 1982. The average rate of retreat was reported to be 0.04 feet per year, but may be as high as 0.5 feet per year. The predicted future rates should be based upon accurate determinations of erosion covering both short- and long-term periods (Gayman, 1985).

The need for high quality, unbiased data is presently well recognized (Gayman, 1985). Accurate estimates of the past rates of shoreline erosion are needed both for future planning and establishing setback requirements for new developments, as well as for evaluating the necessity and efficiency of shoreline protective measures or other alternatives (Gayman, 1985). Monitoring of coastal erosion through remote sensing may be a future possibility.

Analytical Methods

A very thorough discussion of the analytical methods used to assess relative rates of coastal erosion is presented in the USACOE (1996) geotechnical report for the reconnaissance study of the Encinitas shoreline. USACOE groups the methodologies in the following five general categories.

Historical Analyses use historical records, such as maps, aerial photographs, surveys, and such. This method is proven useful in assessing the short-term retreat rates over relatively narrow study areas.

Geomorphic Analyses take into account all geomorphic processes to assess variations in the shoreline erosion. For instance, along a relatively geologically uniform section of the coastline, such as the Solana Beach coastline, a rate of bluff retreat can be assessed qualitatively based on variations in shape of bluff profiles along the coast.

Analyses of Human Activities are necessary considering the enormous human impact on the coastline for the past 40 to 50 years.

Impact of Long-Term Sea Level Changes is considered when long-term rates of erosion are evaluated.

Empirical and Analytical Techniques are numerical models developed to assess shoreline erosion rates. The brief overview of these techniques is given in USACOE, 1996. The landward long-term seacliff base retreat may be estimated based on the shelf-slope method and littoral lens method (Zeiser Kling, 1994). A short-term landward retreat of a seacliff base may be estimated for any beach width for a single storm of a certain recurrence interval using the probabilistic method of Everts, 1991. The long-term down wearing (or vertical scour) rate of the platform may be estimated as approximately 0.02 to 0.04 times the horizontal seacliff retreat rate (Zeiser Kling, 1994).

The methodology used for the USACOE study was applied for the study of the northern part of the Solana Beach shoreline by Group Delta (1998) and may be recommended for future studies.

Rates of Retreat of the Solana Beach Coast

A summary of the geologic erosion rates and measurements of coastal bluff retreat, based on a review of available geologic data, is presented in Table 3.1-2.

Everts (1991) developed an empirical method for the estimate of the long-term mean annual rate of seacliff base retreat for the Oceanside littoral cell. The rate is considerably greater for the cliffs more susceptible to wave attack due to the lack of protective beach buffer. The historical beach profile data may be used to estimate seacliff erosion rates. The USACOE survey in the Solana Beach area north of Fletcher Cove indicated that 100 feet of sandy beach that existed during the 1957-60 survey disappeared by 1988. Using the Everts (1991) method and the reasoning outlined in Zeiser Kling (1994) for similar conditions in the Encinitas area, a mean long-term rate of retreat at Solana Beach corresponding to a mean long-term beach width of approximately 80 feet, and a zero width beach, equals a retreat rate of 0.2 feet per year, and 0.36 feet per year, respectively. Erosion rates presented by reaches accepted from Group Delta (1998) are presented in Figures 2-1 through 2-7.

Benumof and Griggs (1999) correlated long-term erosion rates for the Solana Beach Reach obtained for FEMA's project (discussed in the previous section) with the quantitatively characterized physical properties of the cliff-forming materials and erosional mechanisms (primarily wave conditions). They concluded that, at Solana Beach, seacliffs are composed of relatively high intact rock strength material and are relatively resistant to erosion; Solana Beach cliffs are rated similar to the La Jolla cliffs composed of the older sandstones and siltstones. Geological structure, particularly joint orientation, is of great importance for the seacliff stability. Benumof and Griggs (1999) specifically noted for Solana Beach that even though large storm waves occurring at high tides are particularly effective in causing basal cliff erosion, wave energy reaching the cliff base is significant also during low tide conditions. They also concluded that more resistant Solana Beach type cliffs do not contribute a significant amount of sediment to the beach system.

Table 3.1-2 Coastal Retreat Rates in Solana Beach and Vicinity				
Coastal Landform	Retreat Rate (ft/yr)	Study Period	Location	Source
Short-term rates based on measurements				
Beach	2	1954-1988	Oceanside to Del Mar	Everts, 1991*
Seacliff face	0.04 (average)	1970-1976	San Diego Coast	Lee & others, 1976*, measurements
Seacliff face	0.01	1970-1976	Solana Beach	Lee & others, 1976*, measurements
Seacliff base	0.04 (average)	1970-1976 winters of 1977-1982	Leucadia to Point Loma	Artim, 1985, measurements
Seacliff base	1.3-1.6 (ancient river channel)	1972-1978	Del Mar Beach Club, south Solana Beach	Kuhn and Shepard, 1979
Seacliff base	2.7-4.5 (ancient river channel)	January-April 1978	Del Mar Beach Club, south Solana Beach	Kuhn and Shepard, 1979
Seacliff base	0.26	~1978-2001	Del Mar Beach Club, south Solana Beach, south end of the seawall	Jim Jaffee (Flick, 2001)
Long-term rates				
Seacliff face	0.19-0.36 (average of 0.27)	1932-56 maps, 1994 imagery	Solana Beach	Benumof and Griggs, 1999, historical long-term rate**
Estimated rates				
Seacliff base	0.36 (no beach), 0.2 (at long-term mean beach width ~80 ft.)	empirical graph erosion rate vs. beach width	Oceanside littoral cell, Reach 7 (Everts, 1991) (Solana Beach)	Everts, 1991, long-term mean annual rate

*USACOE (1996)
**Based on measurements over a 68-year period, caution should be exercised when using data extrapolated for over a 100-year period for long-term predictions.

For the purposes of this study, a long-term average erosion rate in the Solana Beach area of 0.4 feet per year (or 40 feet in 100 years) was utilized. This was chosen considering the relatively storm-free period (prior to the El Nino storms of 1982-83 and 1997-98 [Flick, 2001]) during which the data were collected, the historically greater amount of protective beach sand, and the new data (by Graham, San Diego Union-Tribune, February 4, 2001) indicating a greater potential for future erosion due to more wave energy from a more southerly storm track. The estimated 50-year and 100-year top-of-bluff setback lines are shown in Figures 2-1 through 2-7.

Summary

The Planned Coastal Retreat alternative would allow natural erosion processes to occur. If permitted by state law, this alternative would most likely trigger the removal of existing beach protective devices (seacave in-fillings, seawalls, revetments, tie-backs, etc.) so that areas with protective devices would not erode differentially with respect to unprotected areas and cause headland areas, arches, seacaves, etc., which would cause nonuniform erosion and/or a safety hazard. As such, removal of these devices would cause erosion of the cliff base, and an increased potential for landsliding and erosion. As increased erosion of the base of the bluff progressed, the block falls of the Torrey Sandstone would become more likely and large-scale landsliding of the terrace deposits would follow. As the stability of the overall bluff slope would decrease from erosion at the bluff toe, the reduction of irrigation associated with removal of the bluff top residences would slightly increase the overall and surficial stability of the upper bluff area.

In general, planned bluff retreat would not be affected by geohazards such as ground rupture or liquefaction. However, earthquake-induced ground shaking, flooding, and tsunamis would have a significant (negative) effect on the bluff toe area and bluff face if current protective structures were removed and wave action were allowed to erode the base of the bluff. This alternative would increase the potential for erosion, large-scale landsliding, and soil failure. Warning signs or buffer zones would have to be established near the base of the bluff to reduce the potential for injury to the public by eroding soil or block falls. Even with these protections in place, lifeguard and public safety issues would be increased and would result in a significant public safety impact with this alternative. As bluffs crumbled or otherwise gave way to the forces of coastal erosion, people along the beach would be exposed to the risk of injury or possibly even death.

Mitigation

To mitigate differential erosion along the beach, existing protective devices (seawalls, riprap, seacave in-fills, notch in-fills, etc.) would be removed and natural erosion allowed to occur. As these devices are removed, blockfalls, landslides, and/or areas of accelerated erosion may occur. Safe buffer zones would be established at the base of the seacliff for public safety. Additional signage and lifeguard patrol services may be necessary to warn the public and monitor these safe buffer zones respectively. Additionally, the coastal bluff stability should be evaluated and mitigative measures implemented to increase static and dynamic slope stability, if necessary. These measures could include “flattening” or decreasing the slope inclination (angle) of the upper and lower bluff to make the slope more stable. Structures and utilities at and for a distance landward from the top of the bluff should be removed so that bluff retreat would not cause a safety hazard when the bluff (and the improvements supported by the bluffs) fail.

3.2 Land Use

3.2.1 Environmental Setting

This section describes existing land use in the project area. The area includes mostly residential land use atop the entire length of the City of Solana Beach shoreline, and the public beach at the base of the bluffs, which is utilized largely for recreational purposes.

Existing Conditions

The City is located on the northern coast of San Diego County, between the cities of Encinitas (to the north) and Del Mar (to the south). The study area includes properties situated on the top of the coastal bluffs, west of Pacific Avenue and South Sierra Avenue, and down to the beach below (Figure 3.2-1). Solana Beach includes a stretch of approximately 1.7 miles of shoreline. Land use categories consist of primarily residential and recreational/open space uses. The zoning districts within the study area include *High Residential* (HR), *Medium Residential* (MR), *Public/Institutional* (PI), and *Open Space/Recreation* (OSR). HR development is described in the Land Use Plan of the City's General Plan (City of Solana Beach, 1986), as "multi-family residential development within a density range of 13 to 20 units per acre." MR development is described as "single and multi-family residential development within a density range of five to seven units per acre." Detached single-family homes exist along the bluff tops north of Fletcher Cove, and apartments and condominiums exist along the bluff tops south of the cove. PI land use areas include the Marine Safety Center, public restrooms, and the park area situated on the bluff top above Fletcher Cove. Designated OSR land use includes Fletcher Cove Park.

Land use policies applicable to the alternatives include the Land Use Element, Open Space Element, and Safety Element within the City's General Plan. A draft Local Coastal Program (LCP) has been prepared and was submitted to the California Coastal Commission in 2000. The draft LCP is anticipated to be further reviewed in 2002. Coastal Commission staff have indicated that they will take up the LCP again after this MEIR has been certified and the City Council has decided whether to take any action addressing coastal erosion issues.

3.2.2 Environmental Impacts

3.2.2.1 Significance Criteria and Methodology

This section focuses on potential impacts to residential land uses and consistencies with City plans and policies, whereas impacts to recreational land uses are discussed in detail in Section 3.4. For the purpose of this MEIR, land use impacts are considered significant if the proposed alternative will result in:

- conflict with the City's applicable land use plans or policies;
- creation of incompatible land uses within the project area; and
- conflict with existing land uses adjacent to the project area.

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Source: City of Solana Beach GIS Database

Solana Beach Project
Existing Land Use

FIGURE **3.2-1**

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3.2.2.2 Impact Assessment

Alternative 1 – No Project - Continuation of Existing Policy

The construction of shoreline protection structures allowed under the Shoreline and Coastal Bluff Protection Ordinance would affect residential land use along the bluff tops and recreational land use on the beach. Two of the necessary purposes recognized by the Shoreline and Coastal Bluff Protection Ordinance for issuing permits for the construction of seawalls and similar shoreline structures are:

1. To protect existing legally built structures on property when the structure or structures are threatened with imminent danger or destruction from bluff failure due to erosion and other methods of protecting the structure or structures are not feasible, and the benefit of protecting the structure as opposed to removing it outweighs the adverse impact resulting from the construction of the protective device; or

2. To preserve economically viable use of property, when it is demonstrated that without the proposed protection measure, the property could not be used for any economically viable purpose and other methods of protecting or economic usefulness of the property are not feasible.

The Land Use Element in the City's General Plan encourages the development and maintenance of healthy residential neighborhoods, the stability of transitional neighborhoods, and the rehabilitation of deteriorated neighborhoods and would therefore be consistent with the purposes stated above. However, another objective within the Land Use Element is to ensure that long-term protection of the environment is given the highest priority in the consideration of development proposals. Read in isolation, the Shoreline and Coastal Bluff Protection Ordinance could be considered inconsistent with this one particular objective due to the controversial implications of potential environmental impacts associated with seawalls and shoreline protection structures. However, the Ordinance is clearly consistent with other General Plan policies, including those encouraging the maintenance of residential neighborhoods, and thus is considered to be consistent with the General Plan as a whole, including the City policy for long-term protection of the environment. (See *No Oil, Inc. v. City of Los Angeles* (1987) 196 Cal.App.3d 223, 244 ("portions of a general plan should be reconciled if reasonably possible").)

The Open Space Element of the City's General Plan requires new developments to be subject to visual impact analysis where potential impacts upon sensitive locations are identified. It also requires that new structures and improvements be integrated with the surrounding environment to the greatest possible extent. The Safety Element of the City's General Plan discourages the use of seawalls. The Shoreline and Coastal Bluff Protection Ordinance recognizes these policies and is consistent with them because its purpose is to strictly regulate the construction of new seawalls, revetments, bluff retaining walls, and other similar shoreline structures by only accepting projects when necessary to accomplish specific purposes (Municipal Code 17.62.020). Under the Shoreline and Coastal Bluff Protection Ordinance, permits for seawalls, revetments, or bluff retaining walls may only be issued if the structure is constructed and maintained to protect structure(s) from eminent danger, loss of economic viable use of the property, or to abate a public nuisance and incorporate an earth-like appearance resembling the natural bluff, and landscaped to blend in with the existing environment (Municipal Code 17.62.080). Seacave plugs or fills are also required to be designed to resemble the natural color and texture of the adjacent bluffs and to replicate retreat rates (Municipal Code 17.62.100). The Shoreline and Coastal Bluff Protection Ordinance also states that protection measures such as seacaves plugging and filling are preferred over the construction of seawalls and other similar structures (Municipal Code 17.62.020). Therefore, these specific policies do not conflict with City Land Use policies and have less than significant impacts.

Residential land use along the bluff tops could benefit from this alternative because the Shoreline and Coastal Bluff Protection Ordinance allows for bluff protection, which slows bluff erosion rates in front of residences. Therefore, the No Project Alternative would not create incompatible land uses in regard to residential land use. Impacts to recreational land uses are discussed in Section 3.4. Impacts to residential land use specifically would be less than significant.

Mitigation

Impacts would be less than significant to land use under this alternative; therefore, no mitigation is necessary.

Alternative 2 – Repeal of the Shoreline and Coastal Bluff Protection Ordinance

Under existing City policy, the City cannot approve a proposed shoreline protective device unless it is consistent with the requirements of the Shoreline and Coastal Bluff Protection Ordinance. Such devices are also subject to review and approval by the California Coastal Commission, acting pursuant to state law (Pub. Resources Code, § 30235). Under this alternative, the Shoreline and Coastal Bluff Protection Ordinance would be repealed and only the California Coastal Commission would have jurisdiction for permitting shoreline protection structures within the City. The California Coastal Act requires the California Coastal Commission to approve seawalls, revetments, and similar shoreline protection structures, in order to alter shoreline processes and protect existing structures. With respect to land use issues, this alternative would have impacts similar to those of the No Project Alternative because the existing Shoreline and Coastal Bluff Protection Ordinance is consistent with, though more protective than, the Coastal Act's policies on shoreline protection. Therefore, under this alternative, no significant impacts to land use would occur.

Mitigation

Impacts would be less than significant to land use under this alternative; therefore, no mitigation is necessary.

Alternative 3 – Sand Replenishment and Retention Program

Several coastal cities in San Diego County recognize sand replenishment and retention activities as important and necessary measures to preserve their beaches. The General Plan requires the City to preserve open space and public beaches. The Draft LCP has specific goals and policies that support sand replenishment activities for erosion control and beach widening. Solana Beach participated in the SANDAG Regional Beach Sand Replenishment Project and received 140,000 cubic feet of sand fill in June 2001. Sand retention strategies were not part of that project. Therefore, this alternative is consistent with the City's goals and policies concerning beach preservation, though no existing City policy provides any mechanism for generating the very considerable amounts of money needed to pay for periodic sand replenishment or the offshore structures needed to keep sand from drifting offshore or downcoast.

Impacts of placing approximately 140,000 cubic feet on the beach were analyzed in the SANDAG Regional Beach Sand Project Draft EIR (SANDAG, 2000b). According to that document, sand replenishment activities would not impact residential land use. Sand retention strategies would not impact residential land use specifically. Impacts associated with groins, breakwaters, or artificial reefs generally include offshore recreation and net sand loss to adjacent beaches, discussed in other relevant sections of this MEIR. Short-term impacts to land use in general would include temporarily closing sections of the beach to the public, due to safety concerns associated with construction equipment and activities. Construction of any sand retention devices would require offshore areas to be closed temporarily as well. These closures would be limited to specific areas and relatively short time periods. This alternative would have less than significant impacts to land use.

Mitigation

Impacts would be less than significant to land use under this alternative; therefore, no mitigation is necessary.

Alternative 4 – Planned Coastal Retreat Policy

Bluff top development regulatory policies requiring setback lines on the bluff would create new land use policies within the City, which are not directly addressed within existing plans and policies. The Land Use Element in the City's General Plan encourages the development and maintenance of healthy residential neighborhoods, the stability of transitional neighborhoods, and the rehabilitation of deteriorated neighborhoods. Therefore, creating setback lines would have significant impacts to this land use policy in the long term because it would eventually result in the elimination, rather than the maintenance of residences located seaward of the setbacks. Property values would likely lessen as erosion of the bluff approached the setback lines and reduced the economic life of the property. As discussed in Section 2.4, moreover, implementation of this alternative would be inconsistent with state law, which would require the California Coastal Commission to continue to approve shoreline and coastal bluff protection structures where existing structures are threatened by erosion and adequate mitigation for sand loss is available. A change to state law would therefore be required before Alternative 4 becomes potentially viable. It is also possible that courts reacting to likely lawsuits from adversely affected property owners could conclude that this alternative will result in the taking of private property requiring the payment of just compensation for the property. Even if the City or the State offer compensation, property owners might argue that the amounts offered are not enough. At present, the outcome of any such litigation cannot be predicted with any certainty. For all of these reasons, this alternative would have adverse impacts to land use.

Mitigation

The impact to residential land use along the bluff tops from this alternative shall require a new policy to relocate and rebuild displaced structures. However, mitigation will not reduce impacts on land use from this alternative to less than significant levels. Elements of this new policy I could include:

- provisions to adequately compensate homeowners for the economic loss of their property
- provisions to relocate structures, if possible, to another property within the region
- provisions to relocate residents and assist in identification of residences of similar size and quality as the vacated property
- changes to state Public Resources Code, §30235.

At present, it is not clear whether the City, the State, or the City and the State together would be responsible for generating the very large amounts of money necessary to effectuate this alternative. With Public Resources Code section 30235 still in place, any unilateral attempt by the City to implement a Planned Retreat Alternative would fail, but might also leave the City without significant financial exposure, as the Coastal Commission would continue to grant coastal development permits authorizing the construction of protective devices. If, on the other hand, the Legislature were to repeal or modify that statute in a way that eliminated current state policy to approve such devices, subsequent or relatively simultaneous action by the City could leave the City exposed to potential liability for takings absent the dedication of City financial resources to fully compensating property owners whose residential structures would be lost.

3.3 Biological Resources

3.3.1 Environmental Setting

This section describes existing biological resources in the study area. The study area for the purposes of this evaluation is the 1.7-mile Solana Beach coastline extending from the top of the coastal bluffs to the intertidal and nearshore subtidal zone. Focused biological resources field surveys were not conducted for either the marine or terrestrial components of the study area. The biological resources existing conditions rely primarily on a review of existing literature and data, including the recent biological data for the SANDAG Regional Beach Sand Project (SANDAG, 2000). Surveys of the beach, intertidal, and subtidal habitats were conducted in 1999 and 2000 for the SANDAG project, which included Solana Beach and the adjacent areas of Cardiff and Del Mar. A site visit was conducted for this project in October 2001 to collect general biological resources information of the project area.

Terrestrial Vegetation Communities

The terrestrial portion of the study area includes the immediate coastal bluff tops, the cliff faces, and the beach zone to the mean high tide line. The Solana Beach coastal bluff tops have been converted primarily to residential land uses. The backyards of these oceanfront homes, in most cases, abut the cliff face. Landscape plantings and backyard lawns dominate these areas. The dominant species on the cliff faces immediately seaward of the residential developments in Solana Beach are iceplant (*Mesembryanthemum crystallinum*), hottentot and sea figs (*Carpobrotus edulis* and *C. chiensis*), and sea lavender (*Limonium perezii*). These species are well adapted to coastal conditions and are common along the entire coastline. Because of the steepness of the slope in many areas, 50 to 70 percent bare sandstone occurs in many areas. Remnant coastal bluff scrub and coastal dune species are uncommon along the immediate cliff edge and on the cliff face. Around Tide Park in northern Solana Beach, sea lavender, hottentot fig, and sea fig dominate. Various succulent species plantings and tea tree (*Melaleuca* sp.) have also become established. This species assemblage is characteristic of the majority of the 1.7-mile study area. At the Del Mar Shores access point in southern Solana Beach, the slope is less steep and the vegetative cover is greater than in most other cliff sections of Solana Beach. Tea tree, acacia (*Acacia* sp.), and sea fig dominate. Sea rocket (*cakile maritima*), quail bush (*Atriplex lentiformis*), and coast goldenbush (*Isocoma menziesii*) are occasional in this area.

The beach area along the Solana Beach coastline is a relatively narrow stretch of sand with cobble bands. In general, a lower density of cobbles and higher proportion of sand characterize the southern section of the Solana Beach study area. The northern segment of the project area has a higher density of cobble. No terrestrial vegetation is associated with the beach and intertidal zone.

Marine Vegetation Communities

The subtidal zone along Solana Beach is characterized by a soft-bottom (sand) substrate with several rocky intertidal and low relief reef areas (hard-bottom). The hard-bottom rocky intertidal community is characterized by simple green algae (*Chaetomorpha, Enteromorpha, and Ulva*). In more permanent substrates in the intertidal zone, simple green algae species, coralline algae (*Corallina spp.*), and surfgrass (*Phyllospadix*) occur. The subtidal reefs support a variety of coral species and fish species, described below. Farther offshore, giant kelp (*Macrocystis pyrifera*) and feather boa kelp (*Egregia menziesii*) forests occur.

Wildlife

The limited terrestrial vegetation within the study area does not provide adequate habitat to support a diverse assemblage of terrestrial wildlife. The reptile and mammal species within the project area are generally those species that are compatible with residential development and disturbed habitats. Common species with the potential to occur in the vicinity of the bluff tops and cliff face include western fence lizard (*Sceloporus occidentalis*), Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Spermophilus beecheyi*), opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*).

The intertidal sand and cobble beach has the potential to support a number of invertebrate species including beach hoppers (*Orchestodea* spp.), sand crabs (*Emerita analoga*), and polychaete worms (*Euzonus* spp., *Lumbrineris* spp., *Nephtys* spp., S*cololepis* spp., and *Scoloplos* spp.).

The soft- and hard-bottom substrates of the intertidal and subtidal marine habitats have the potential to support a variety of invertebrate and vertebrate wildlife species. The soft-bottom intertidal and subtidal areas support species adapted to the dynamic nature of the nearshore zone, which is frequently disturbed by breaking waves and ocean swells. Shallow bottom nearshore species with the potential to occur in the project area include the polychaete (*Apoprionospio pygmaea*), bean clam (*Donax gouldii*), and amphipod (*Mandibulophoxus uncirostratus*). Fish species in the nearshore soft-bottom habitat include speckled sanddabs (*Citharichthys stigmaeus*), halibut (*Paralichthys californicus*), and shovelnose guitarfish (*Rhinobatos productus*). Although California grunion (*Leuresthes tenuis*) are known from the sandy nearshore zone, grunion prefer wide gently sloping beaches and are not expected to spawn on the narrow cobbly beaches in the study area.

Hard-bottom habitats include rocky intertidal shores and subtidal reefs. The rocky intertidal zone is characterized by barnacles (*Cthamalus*), limpets (*Collisella* and *Lottia*), California mussel (*Mytilus californus*), gooseneck barnacles (*Pollicipes polymerus*), and hermit crabs (*Pagurus*). Nearshore hard-bottom habitats commonly support green sea anemones (*Anthopleura xanthogrammica*), purple sea urchins (*Strongylocentrotus purpuratus*), and starfish (*Asterina miniata* and *Pisaster* spp.). Of the hard-bottom types, low relief subtidal reefs are the most common in the project area section of coastline. These low relief reefs typically support sea fans (*Muricea*), sea palms (*Eisenia arborea*), sponges, and starfish. Occasional high relief reef areas occur at and north of Tide Park in northern Solana Beach, north and south of Fletcher Cove, and at the Del Mar Shores access point. These areas support a similar, but often more diverse, assemblage of invertebrate and vertebrate species as the low relief reefs.

The common fish species in the nearshore hard-bottom habitat include the wooly sculpin (*Clinocottus analis*). On more developed low and high relief reefs, a variety of fish have the potential to occur, including garibaldi (*Hypsypops rubicunda*), blacksmith (*Chromis punctipinnis*), and black perch (*Embiotoca jacksoni*). Further offshore, the kelp forests typically support surfperch and rockfish (*Sebastes* spp.).

The nearshore waters of the San Diego region are known to support numerous resident and migrant marine mammals. Common species with the potential to occur in the study area include California sea lion (*Zalophus californicanus*), common dolphins (*Delphinus delphis*), and bottlenose dolphins (*Tursiops truncatus*). California gray whales (*Eschrichtius robustus*) can be observed migrating offshore between December and February and between February and May.

The coastal wetland, cliff, beach, and nearshore habitats of the San Diego region support a diverse assemblage of resident and migrant bird species. Gulls and shorebirds commonly forage and roost on the beaches of the study area. The nearshore open water of the study area typically supports gulls, terns, pelicans, and cormorants.

<u>Sensitive Species and Habitats</u>

Nearly the entire City of Solana Beach has been converted to urban development. Small, steep canyons surrounded by development remain as native vegetation in parts of the City, but are severely fragmented. The only appreciable area of native habitat remaining within the city boundaries occurs along the southern edge of San Elijo Lagoon. The majority of San Elijo Lagoon is located within the Encinitas city boundary. This coastal salt marsh habitat, as well as the coastal salt marsh of the San Dieguito Lagoon to the south, support a wide variety of plant and animal species. Rare plant and animal species are also known from these areas; however, these lagoons are not considered within the study area.

Although limited habitat for sensitive species occurs within the City boundaries, adjacent areas have the potential to support these species. A database search of the sensitive species known from the Encinitas and Del Mar regions returned 42 plant species, 7 invertebrates, 3 reptiles, 9 birds, and 3 mammals. In addition, 5 sensitive habitat types occur in this region. Because nearly the entire native habitat has been converted to development in Solana Beach and especially within the study area, the potential for most of these sensitive species to occur in the study area is extremely low. Of the sensitive species known from the region, several coastal bird species have the potential to forage and roost on the beaches of the study area. Nesting sites of the federal and state listed endangered California least tern (*Sterna antillarum browni*) and federally listed threatened western snowy plover (*Charadrius alexandrinus nivosus*) are known from San Elijo Lagoon. These species have the potential to roost and forage within the study area, but nesting habitat for these species does not occur in the study area. Although suitable nesting habitat does not occur in the study area, the federal and state listed endangered California brown pelican (*Pelecanus occidentalis californicus*) is known to forage in the nearshore waters of Solana Beach.

Regional Conservation Planning

The north San Diego County coastal cities, in association with SANDAG, are currently in the public review phase of the Multiple Habitat Conservation Program (MHCP). The seven-city study area for the MHCP includes Solana Beach and Encinitas. The purpose of the MHCP is to create a regional preserve system designed to sustain viable populations of sensitive plant and animal species while maintaining continued economic development and quality of life. The MHCP is one of several large habitat planning efforts in the county. The Multiple Species Conservation Program (MSCP) is the approved plan covering the City of San Diego and county lands around the City. Del Mar, which abuts Solana Beach to the south, is part of the MSCP planning area. Rancho Santa Fe, abutting Solana Beach to the east, will be covered by the North San Diego County MSCP, which is currently in the development phase.

These planning efforts are relevant to this evaluation because they establish policies related to the protection of biological resources. The MHCP, which when approved will cover Solana Beach, has been developed to help manage the cumulative impacts resulting from growth in the region. To avoid conflicts with MHCP policies, policy changes within Solana Beach regarding sensitive biological resources should be consistent with regional habitat conservation guidelines. Although Solana Beach has limited remaining biological resources within its jurisdiction, any potential impact to these resources resulting from changes in City policy needs to be evaluated in relation to region wide habitat conservation policies.

3.3.2 Environmental Impacts

3.3.2.1 Significance Criteria and Methodology

This section focuses on potential impacts to biological resources resulting from the alternative City policies regarding shoreline and coastal bluff protection. For purposes of this analysis, impacts to biological resources resulting from the alternative policies are not classified as direct or indirect. Technically, direct impacts to biological resources would only result from specific projects allowed or encouraged under the policy. Therefore, impacts have not been classified into direct and indirect or temporary and permanent.

For the purpose of this MEIR, impacts to biological resources are considered significant if the proposed alternative would result in:

- a reduction of the number of, a restriction of the range of, or other adverse effects upon an endangered, rare, or threatened plant or animal or its habitat;
- substantial loss of habitat for commonly occurring wildlife, fish, or plant species;
- substantial interference with the movement of migratory wildlife or fish species;
- conflict with local, state, or federal environmental plans or policies aimed at protecting sensitive biological resources;
- cause a fish or wildlife population to drop below self-sustaining levels; or
- threaten to eliminate a plant or animal community.

For the purposes of assessing impacts to biological resources resulting from the alternative City policies related to shoreline protection, this evaluation must necessarily remain focused at the policy level. Each alternative shoreline protection policy or program may potentially allow various impacts to biological impacts, and these impacts can only be evaluated at the program level. Specific project-related impacts will necessarily be evaluated during the development and review of specific projects. For reasons explained in Section 1.5 through 1.51.3, such specific projects may require the preparation of mitigated negative declaration, focused EIRs, or ordinary EIRs, depending on the nature and extent of their impacts.

3.3.2.2 Impact Assessment

Alternative 1 – No Project - Continuation of Existing Policy

The No Project Alternative would maintain the current City policy with regard to shoreline protection. The policy allows the construction of various shoreline protection structures along the coast, based on established guidelines. The ultimate result of maintaining the existing shoreline protection ordinance is the continued development of these structures. Although the specific impacts of constructing or maintaining specific structures is not evaluated, the potential impacts resulting from the policy allowing the structures to be built is evaluated below.

Under this alternative, the preferred strategy for coastline protection in Solana Beach is through shoreline protection structures. Implementation of this strategy would presumably be through the construction of new structures, where needed, along Solana Beach's cliffs. This policy would contribute to the following effects on biological resources in the project area.

Implementation of this policy, and the resulting construction of protection structures, would contribute to the continued reduction in beach width within the project area. This would contribute to the loss of foraging and roosting habitat for common gulls and shorebirds. As the California least tern and western snowy plover are known from the vicinity, the reduction in beach width would result in the loss of potential foraging and roosting habitat for these sensitive species.

The contribution of this policy and the construction of structures, to the acceleration of beach loss, is difficult to determine against the baseline loss of beach width. The loss of beach width and potential loss of foraging and roosting habitat for these species is considered less than significant. Considering the lack of suitable grunion spawning beaches within the project area, no impact to this resource is expected.

The reduction in beach width would also result in reduction in the width of the intertidal zone within the project area. An alteration of the wave action zone in the intertidal and nearshore subtidal may also result. The reduction in area of intertidal would reduce the habitat for the algae and invertebrate species that inhabit this zone. This impact is considered less than significant. Because these species are common in the region and have rapid recovery rates, the potential shift in species composition in the nearshore subtidal zone is considered less than significant.

Shoreline protection structures result in the beneficial effect of maintaining the marginal bluff top and slope habitat in the project area. The wildlife and plant species that occur on these slopes would be retained behind the structures, thus preventing their eventual loss to wave action. This is not a significant beneficial effect due to the marginal quality habitat occurring in these areas.

Due to the lack of substantial habitat area in the city, no MHCP habitat preserve has been designated in the study area. Although limited foraging and roosting habitat for MHCP covered shorebirds occurs on the beaches in the study area, this habitat is not suitable for nesting and has not been deemed essential to these species by the MHCP. During the review of specific projects allowed under this alternative, MHCP guidelines should be examined to ensure avoidance of impacts to these species. No conflict with MHCP policies, or other regional policies designed to protect biological resources, would result from this alternative.

No significant impacts would occur to biological resources from this alternative; therefore, no mitigation measures are proposed.

Alternative 2 – Repeal of the Shoreline and Coastal Bluff Protection Ordinance

Under the existing policy, a property owner seeking approval for a shoreline protective device must obtain a permit from the City pursuant to the Shoreline and Coastal Bluff Protection Ordinance, and must then obtain approval of a coastal development permit from the California Coastal Commission's review and approval. Under this alternative, the Shoreline and Coastal Bluff Protection Ordinance would be repealed and only the California Coastal Commission would have jurisdiction for permitting shoreline protection structures within the City. The California Coastal Act requires the California Coastal Commission to approve seawalls, revetments, and similar shoreline protection structures, in order to alter shoreline processes and protect existing structures in danger from erosion, provided that there is adequate mitigation for sand loss. This alternative would have impacts similar to those of the No Project Alternative because shoreline protection structures would continue to be built. Therefore, under this alternative, no significant impacts to biological resources would occur and no mitigation measures are proposed. See the discussion under Alternative 1 for the potential effects of both Alternative 1 and Alternative 2.

Alternative 3 – Sand Replenishment and Retention Program

Several coastal cities in San Diego County recognize sand replenishment and retention activities as important and necessary measures to preserve their beaches. Solana Beach participated in the SANDAG Regional Beach Sand Replenishment Project and received 140,000 cubic feet of sand fill in June 2001. Sand retention strategies were not a component of the project. This is a prime example of a specific project that would be permitted and encouraged under the potential city policy evaluated under Alternative 3.

Of the four alternatives evaluated, the policy of Sand Replenishment and Retention has the highest potential to affect biological resources. Although specific project-related impacts will not be assessed here, the suite of methods and structures that could be employed under this strategy could affect both terrestrial and marine resources.

Sand Replenishment

In this evaluation, it is assumed that the sand replenishment option that would be employed in Solana Beach is the sand replenishment method recently completed in June 2001 by SANDAG. Similar projects could be implemented on a one-time or ongoing basis. The location of the replenishment site at Fletcher Cove was designed to avoid potential impacts to biological resources. Fletcher Cove was selected because it was the most accessible site along the Solana Beach coast and this location had the least impact to existing kelp beds. An alternative site, Tide Park, was considered but was rejected because of existing rocky reefs and kelp beds offshore and the site was not as accessible as Fletcher Cove. Beach replenishment at Fletcher Cove was designed to receive approximately 140,000 cubic yards of sand along approximately 1,800 feet (0.3 mile) of the beach. The northern boundary of the proposed fill site started just south of Fletcher Cove and extended southward to the Del Mar Beach Club. A berm was constructed to an elevation of approximately 12 feet above MLLW. The berm was flat and extended seaward approximately 100 feet. The beach fill was sloped seaward approximately 135 feet at a slope of 10:1.

Impacts to subtidal hard-bottom and soft-bottom habitat from the direct deposition of sand at this location would be considered less than significant. The widespread occurrence and rapid recovery rates of the organisms inhabiting these habitats indicate that impacts to these resources would be less than significant. The lack of suitable grunion spawning beaches within the study area indicates that no impacts to this species or their habitat would result from this alternative, and spawning habitat would potentially be created through this action. Other potential impacts resulting from implementing this alternative include temporary loss of shorebird foraging habitat, temporary increase in water turbidity near the deposition site, temporary loss of seabird foraging area near the turbidity plume, and alteration of natural sediment transport processes near the deposition site. These potential impacts are considered adverse but less than significant.

Replenishment of other beach sections within Solana Beach or deposition of greater sand volumes would require further evaluation of impacts. Implementation of this alternative north of Fletcher Cove has the potential to impact sensitive species based on the proximity of nesting and foraging California least terns and western snowy plovers. In addition, the deposition location and sand quantity are important to consider because they have the potential to more adversely impact subtidal reef habitats and the species that occur there. The potential burial of reef habitat, which supports various kelps and surfgrass, could impact sensitive and/or recreationally and commercially important invertebrates and fishes that utilize those habitats during various life stages (e.g., lobster, urchins, crabs, abalone, fishes, etc.).

Future sand replenishment efforts should be guided by the recent SANDAG project. The location of future sand replenishment site or sites would be dependent upon the volume of sand available. Impacts to biological resources from comparable replenishment efforts in Solana Beach should employ the methods, locations, quantities, and mitigation measures utilized in the SANDAG project to avoid and minimize impacts to biological resources. Alternative methods, sites, or sand quantities than those used in the previous project have the potential to adversely impact biological resources. Mitigation measures may be necessary for alternative sand replenishment projects.

Sand Retention

The sand retention component was not part of the recent SANDAG project. Therefore, the sand deposited on the beaches in the region only provides a temporary solution to beach preservation and shoreline protection. Without retention structures in place, replenishment efforts must be ongoing in order for this alternative to be a long-term solution. Retention structures include jetties, groins, artificial headlands, and artificial reefs that act to keep the replenished sand in place. A long-term policy with a sand retention component would involve the construction of one or more of these structures offshore of the project area. The construction of a structure of this type would have both temporary and permanent direct impacts on marine resources in the project area. The construction of these structures could potentially result in the permanent loss of low and high relief reef habitat and could displace the fish species supported by these habitats. These structures would effectively alter the long-term wave dynamics in the nearshore zone. Water circulation, nutrient cycling, and the temperature regime may be affected, thereby potentially altering fish species composition. These impacts may result in the displacement of foraging seabirds and marine mammals. Detailed technical studies should be undertaken on the specific effects of these structures and how they would impact the resources of Solana Beach. Various state and federal approvals would be required to construct these structures as listed in Table 1-2. Federal approvals and permits would require compliance with the National Environmental Policy Act (NEPA).

Impacts to sensitive reef areas have the potential to be significant. Impacts to ephemeral reef habitats most likely would be adverse, but not significant. Placement of higher relief reef habitat in an area of ephemeral reef may have habitat enhancement benefits. Indirect sedimentation impacts to sensitive reef areas have the potential to be significant. Sedimentation to ephemeral reefs is a natural seasonal phenomenon and would not constitute a significant impact. Solana Beach has a low potential for impacts to sensitive reef habitat; therefore, no significant impacts to sensitive reef areas are anticipated. Temporary turbidity impacts to endangered least tern nesting sites within the area could result during construction of breakwaters or reefs. These impacts would be mitigated to a level below significance by modifying construction schedules to avoid the nesting season (SANDAG 2001b).

In general, sand replenishment and retention are consistent with the guidelines of the MHCP. As there is limited habitat and no proposed MHCP habitat preserve within the project area, no conflict with MHCP planning areas is anticipated from this alternative. In developing specific replenishment and retention projects under this alternative, the conservation guidelines for

MHCP covered species, especially California least tern, western snowy plover, and brown pelican, should be reviewed to ensure these projects avoid significant impacts to these sensitive species.

Mitigation

In order to reduce temporary and significant impacts to the endangered least tern nesting sites, mitigation measures would be implemented. As stated above, more research and technical studies may be required to properly mitigate specific sand retention projects. The following mitigation was developed specifically for artificial sand retention reefs, breakwaters, and groins within the Regional Beach Sand Retention Strategy by SANDAG:

- avoid construction in reef habitat areas.
- create hard substrate subtidal habitat when rock groins are implemented.
- avoid construction during least tern nesting season.
- implement an environmental monitoring program during sand replenishment and construction operations

<u>Alternative 4 – Planned Coastal Retreat Policy</u>

Under this alternative, City and Coastal Commission policies (after a change in state law) would allow the seacliffs to naturally erode through continued wave action, thereby allowing the landward boundary of the beach to occur naturally. This alternative involves the establishment of setback lines at estimated 50- and 100-year bluff setback lines, where no new development would be allowed. This alternative would result in a shift in policy away from the current shoreline protection and replenishment strategies. Under this alternative, it is assumed that no new shoreline protection structures would be allowed by the City, thus allowing the natural cliff erosion process to occur. No impacts to biological resources from this alternative are anticipated and no conflicts with regional policies regarding the protection of biological resources would occur.

Mitigation

No significant impacts would occur to biological resources under this alternative; therefore, no mitigation is necessary.

3.4 Recreation and Public Access

3.4.1 Environmental Setting

Only beach and public access recreational land uses will be considered for the purpose of this study. Recreation is limited to the amount of beach and open space that could be utilized. Lateral access along the beach is considered equally important and congruent with the definition of recreation. This section also identifies public access points along the bluffs that include stairways from the upper coastal bluffs to the beach, which is subject to the existing Shoreline and Coastal Bluff Protection Ordinance.

The greatest use of the Solana Beach shoreline for recreational purposes occurs during the spring, summer, and fall seasons, by both residents and visitors from outside the region. Recreation facilities in the area include beach areas such as Fletcher Cove and Tide Park in the north. The 1.7-mile stretch of beach also provides recreational space for running, walking, lounging, and a variety of beach activities. The entire coast of Solana Beach is also used for surfing and some of the favorite spots include Table Tops (north of Tide Park), Pill Box (immediately north of Fletcher Cove), Cherry Hill (south of Fletcher Cove), Rock Pile (Del Mar Shores Beach), and Secrets (south of Del Mar Shores private access).

There are eight existing vertical access points to the shoreline, all of which are functional ramps or stairways (Figure 3.4-1). Four access points are public and four are private, each divided by a distance of 1,000 to 2,000 feet. Public access points exist at Tide Park, Fletcher Cove, Seascape Surf, and adjacent to Del Mar Shores Terrace. Some stairways have been damaged or have collapsed due to past storms, but have since been repaired and are well maintained. The stairs at Seascape Surf were repaired in 1995, and Tide Park's stairs were reconstructed in 1999. The stairs adjacent to the Del Mar Shores Terrace are highly protected by revetment, and well-maintained access because Fletcher Cove is naturally protected by a wide section of beach.

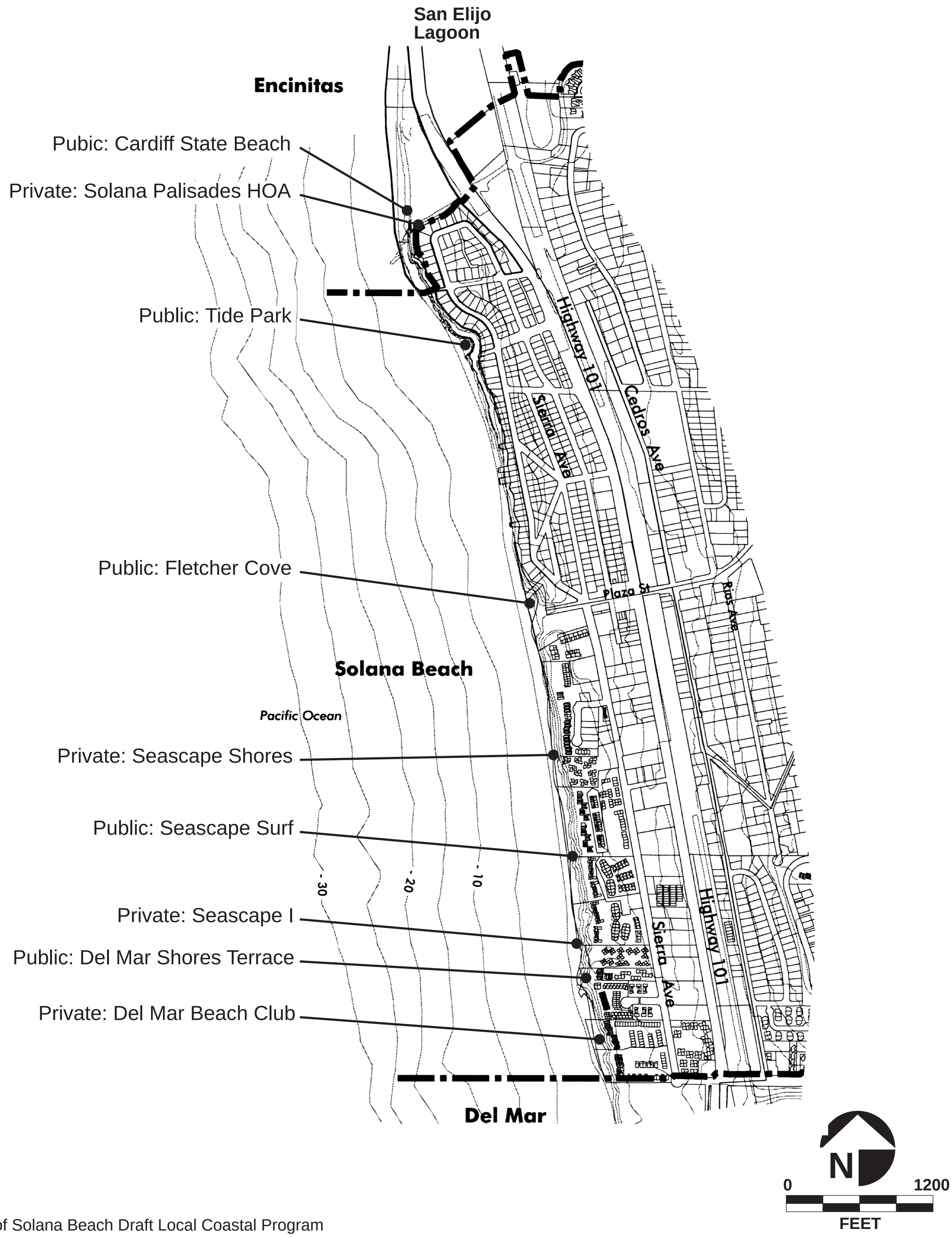
Lateral beach access exists from the north at Cardiff State Beach and from the south at Del Mar. The beach is generally narrow and is the most discontinuous in the northern portion of the City shoreline due to the tide. During medium tides, areas along the southern shoreline are often impassible. At high tides, lateral beach access is often limited to the small sandy area at Fletcher Cove.

3.4.2 Environmental Impacts

3.4.2.1 Significance Criteria and Methodology

For the purpose of this MEIR, recreational land use refers to beach recreational uses. Thresholds of significance for recreation are considered the same for public access. Impacts to recreation and public access under this alternative are significant if the proposed alternative will result in:

- a potential long-term degradation of recreational opportunities;
- a substantial decrease in lateral beach access due to sand loss or reduction of the beach; and
- restricting existing public access or access structures (stairways).



SOURCE: City of Solana Beach Draft Local Coastal Program

FIGURE

3.4-1

Recreation and Public Access Areas

amec

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3.4.2.2 Impact Assessment

Alternative 1 – No Project - Continuation of Existing Policy

In general, impacts of shoreline protection structures to recreation and public access on beaches are assessed by their potential to induce sand loss, or reduction of beach width in front of a structure. Sand loss directly impacts public recreational opportunities by reducing the amount of open space on the beach for recreational activities. Lateral access along the beach is decreased as the amount of sand decreases and the beach becomes narrower. Public access also includes stairways and ramps, which allow for beach access from inland areas and the upper bluff. Some shoreline structures can be designed to help stabilize a stairway into the bluff. Shoreline structures allowed under the No Project Alternative generally have no significant impacts on stairways or ramps.

Impacts of protective shoreline structures on the beach have been a controversial issue because different studies have opposing conclusions. Some studies, such as one conducted in Monterey Bay (Griggs and others, 1994), conclude that no significant loss of beach occurs in front of protective structures, such as a seawall, compared to the amount of sand loss in front of unprotected areas. On the contrary, however, some studies, such as the SANDAG Preliminary Technical Report, conclude the opposite, describing the potential for sand loss or beach width to decrease as a result of shoreline structures (SANDAG, 1992). Although controversy remains over the impacts of seawalls, it is important to assess the potential effects recognized in current and ongoing studies. Based on the findings of these studies, shoreline structures, such as those allowed under the existing Shoreline and Coastal Bluff Protection Ordinance, have the potential to impact long-term recreational opportunities and lateral beach access, by reducing the amount of sand on the beach in the following ways:

1. *Fixing the landward boundary of the beach*. As the shoreline naturally retreats landward, and the natural bluff face retreats at the same time, seawalls and other hard shoreline structures built along an eroding bluff will not retreat. This impact is a gradual loss of beach in front of the structure as the tide or shoreline continues to migrate landward, and sea levels continue to rise. Additional erosion is also a consequence, which involves an increased rate of erosion to the natural bluff adjacent to a seawall. An average long-term erosion rate of approximately 0.4 feet per year, or 40 feet per 100 years has occurred at Solana Beach. Unlike seawalls or revetments, seacave plugs and fills are designed to erode at the same rate as the bluff and are required under the Shoreline and Coastal Bluff Protection Ordinance to prevent this process. However, seacave plugs and fills are not always effective and may not erode as rapidly as the adjacent bluff. Therefore, fixation of the landward beach boundary results in potential long-term loss of beach width and recreational opportunities and is considered a significant impact to recreation.

2. *Reduction of sediment contribution*. Seawalls and other shoreline structures prevent natural erosion processes of coastal bluffs. Therefore, the bluff will not naturally erode and cannot contribute to sediment on the beach in front of it. However, the amount of sediment that is denied from eroding is generally not significant in Solana Beach. The estimated rate of sand contribution from bluff erosion alone specific to Solana Beach is 1 to 6 cubic yards per yard per year, or less than 15,000 cubic yards of sand per year; 1 percent of gross longshore transport for all of Solana Beach (Flick, 2001). Therefore, the reduction in sediment contribution due to bluff protection structures is not considered a significant impact because it will not result in long-term degradation of recreational opportunities.

3. *Beach encroachment/placement loss*. This refers to when a seawall or shoreline structure is constructed seaward of the base of the seacliff, there is a reduction in the average beach width. The boundary of the beach is moved toward the ocean, therefore reducing the amount of beach. Therefore, this effect has significant impacts to recreation. Seacave and notch fills are different in that they are backfill and do not extend the natural bluff boundary seaward.

4. *Wave reflection.* A seawall or protective structure such as seacave and notch fills may induce the seaward transport of sand, due to increased reflection of wave energy. This could result in a reduction of mean beach width over the long term and is therefore potentially significant to recreation.

5. *Erosion of tidal terrace.* If bluff retreat is fixed by a seawall or protective structure such as a seacave and notch fills, new tidal terrace is not formed. Implications of this effect on recreation and public access would be a loss of level beach and increased sand loss. Therefore, impacts would be significant.

Based on the findings above, under the No Project Alternative, impacts from seawalls to recreation and lateral beach access would be more significant as compared to seacave and notch fills. Seawalls could fix the landward boundary of the beach, reduce the amount of beach, increase the reflection of wave energy, and the erosion of tidal terrace. Seacave and notch fills, in contrast, could fix the landward boundary of the beach, increase the reflection of wave energy, and the erosion of the tidal terrace, but would not reduce the amount of beach as would occur with seawalls. Impacts to access structures, such as stairways, would be less than significant.

Mitigation

To mitigate the potential effects of shoreline protection structures, as stated above, the following mitigation measures were developed (also described in Section 3.1):

- *Fixation of beach boundary.* This can be mitigated using artificial beach replenishment provided the program is properly designed to maintain a protective beach width in front of the structures.

- *Reduction in sediment contribution.* This can be mitigated with ongoing beach replenishment.

- *Beach encroachment/placement loss.* This can be mitigated by locating the protective structure as close as possible to the base of the seacliff.

- *Wave reflection.* This can be mitigated through proper design techniques as described in Section 3.1.

- *Erosion of tidal terrace.* This impact can be mitigated with sand replenishment.

As explained earlier, should the City decide to leave its existing Ordinance in place, it would not be "approving" a "project" with "significant environmental effects," and thus would be under no legal obligation to adopt the above-referenced "mitigation measures," even if they are "feasible" within the meaning of CEQA. The City is therefore free to decide whether, and to what extent, to participate in any of these mitigation strategies.

<u>Alternative 2 – Repeal of the Shoreline and Coastal Bluff Protection Ordinance</u>

Under this alternative, shoreline structures would be permitted under the jurisdiction of the California Coastal Commission, in compliance with the California Coastal Act. Impacts to recreation and public access would be greater with this alternative as compared with the No Project Alternative because Alternative 2 is not as proactive as the City's Shoreline and Bluff Protection Ordinance, which encourages seacave and notch fills over seawall construction. The City of Solana Beach could encourage the California Coastal Commission to revise its current policy and take a more proactive approach to coastal bluff protection similar to the City's Ordinance, which help to reduce the impacts of seawalls. However, since California Coastal Commission policy changes are out of the control of the City of Solana Beach, this would not be a feasible mitigation measure as far as the City is concerned, though the Commission would be free to modify its past policies, consistent with the framework created by the Coastal Act. Therefore, impacts to recreation and lateral public access would be significant. Impacts to public access structures would be insignificant.

Mitigation

All mitigation measures required under the No Project Alternative for recreation and public access could be applied to this alternative. It is important to remember, however, the nature of the action that would be taken pursuant to Alternative 2. The City would be repealing its existing Ordinance while leaving the Coastal Commission still subject to Coastal Act requirements mandating the issuance of permits for coastal protective structures in some instances. Under such a scenario, the City's action would not be the sole, or even the dominant, cause of any continuing negative consequences associated with the continuing approvals of shoreline protection structures, as the Coastal Commission would continue to approve such structures. Thus, as with Alternative 1, the City would have broad discretion as to whether to undertake any role in carrying out policies that might mitigate the effects of continuing Coastal Commission approvals.

<u>Alternative 3 – Sand Replenishment and Retention Program</u>

This alternative would entail efforts to restore and replenish the beach. Short-term impacts would temporarily affect recreation and public access in specific areas, due to temporary beach section closures. Retention construction would be offshore and would potentially directly impact offshore recreation on a temporary basis. Indirect impacts to surfing could occur if the retention structure interfered with wave patterns in the surf zone. SANDAG's Regional Beach Sand Retention Strategy (SANDAG 2001b) report recognizes potential loss of surfing opportunities with the construction of breakwaters and possible improvement to surfing at nearby groins, which would require further study. Construction of artificial structures, such as a reef, in the surf zone could pose a public safety hazard to swimmers, surfers, and boaters.

However, long-term impacts to recreation and public access would be beneficial because any increase in the amount of sand on the beach will provide for an increase in long-term recreational activities, and more beach width for lateral access. It is important to note that 140,000 cubic yards of sand replenishment, as implemented in June 2001, was beneficial, yet not nearly enough sand to fully replenish all of Solana Beach. Cumulative impacts associated with sand retention structures such as groins and breakwaters include erosion on a downdrift beach unless beach nourishment is continual. Design features such as pre-filling the updrift beach and short groin fields that allow sand to bypass and flow downdrift would lessen this impact; however, these mitigation measures alone would not reduce cumulative impact below a level of significance. Sand replenishment alone would not have significant cumulative impacts to adjacent beaches as discussed in Section 3.1.

Mitigation

Loss of surfing opportunities resulting from the construction of breakwaters could be mitigated with the construction of a separate artificial surf reef, for the sole purpose of enhanced surfing opportunities. Potential mitigation measures to reduce safety impacts to swimmers, surfers, and boaters from the construction of reefs could include public education, increased lifeguard patrol services, and clear and effective signage (SANDAG 2001b). Other impacts would be beneficial to recreation and public access under this alternative; therefore, no mitigation is necessary. The funding for construction of an artificial surf reef would have to be worked out in connection with federal and state agencies, as well as SANDAG, as part of a larger program to replenish and retain sand along the coast. At this point it is impossible to predict whether, given likely limitations on any state, federal, or regional funds, the mitigation of impacts on surfing opportunities will be a priority on a par with other demands for limited funds.

<u>Alternative 4 – Planned Coastal Retreat Policy</u>

Public access could be impacted in the long term if the "no new development" setback included public stairways. As the bluffs continue to erode, public access stairways will become more unstable and a safety hazard. Without proper public access, recreation would be largely impacted as well because it would be more difficult for people to get to the beach from the upper bluffs. Therefore, if no new public access structures were permitted due to this alternative, impacts to recreation public access would eventually be adverse.

If public access structures were exempt from the “no new development” setback lines, then improvements to existing structures, or construction of new structures would be allowed. Under these circumstances, impacts to public access would be insignificant.

Mitigation

To maintain proper public access to the beach from the bluff tops, public access structures such as stairways and ramps should be exempt from the “no new development” setback lines. This exemption would allow for repair, maintenance, redevelopment, and new development of any public access structures, as needed over the long term, and as erosional processes on the bluff continued to take place.

3.5 Population and Housing

3.5.1 Environmental Setting

Population and housing are primary socioeconomic attributes within a community. Population is generally expressed in terms of the number of people residing within an area and housing is described with regard to the number of housing units, vacancy rates, and occupancy characteristics in the area.

Existing Conditions

Population

The City of Solana Beach’s population in the 2000 Census was 12,979, representing a population growth of only 17 people since 1990. The City’s 2000 population represents about 0.4 percent of San Diego County’s total population of 2,911,500 (SANDAG, 2000).

Housing

The City’s number of housing units is currently 6,499 residences, of which 5,495 are occupied (13.4 percent vacancy rate). The average number of persons per household is 2.54 (SANDAG, 2000). In the study area, which includes all residences fronting the 1.7-mile stretch of the shoreline, there are approximately 55 houses and 893 condominiums. Single-family homes are located north of Fletcher Cove along Pacific Avenue and condominiums are located south of Fletcher Cove along Sierra Avenue. The bluff tops are currently built out with no vacant or undeveloped parcels.

3.5.2 Environmental Impacts

3.5.2.1 Significance Criteria and Methodology

Potential impacts to population and housing were assessed with regard to the potential for these resources to be altered by the alternatives.

- *Population.* Impacts are generally not considered to be either adverse or beneficial by themselves; however, impacts may have consequences for other environmental resources (e.g., housing, public services). For the purpose of this MEIR, impacts to population are consequential of impacts of the proposed alternative to housing.

- *Housing*. Any significant threat to the conditions of existing residential structures would be adverse to property owners and homeowners. Any decrease in property value of a residence would be adverse for property and homeowners. Any significant increase in vacancy rates would be adverse for landlords and home sellers. Although the loss of existing residential structures would be a physical impact subject to CEQA (see *Concerned Citizens of South Central Los Angeles v. Los Angeles Unified School District* (1994) 24 Cal.App.4th 826), reductions in property values do not constitute "environmental impacts," and thus are in no way protected by CEQA (*Hecton v. People of the State of California* (1976) 58 Cal.App.3d 653, 656).

3.5.2.2 Impact Assessment

<u>Alternative 1 – No Project - Continuation of Existing Policy</u>

The City's population has remained continuous with a growth of only 17 people since 1990. The existing Shoreline and Coastal Bluff Protection Ordinance was implemented in 1994 and has since had no effect on population. Therefore, under the No Project Alternative, the existing policy would remain and no impacts to population, such as directly inducing growth, would occur.

With regard to housing, the No Project Alternative would entail the continuation of allowing permitting shoreline structures under appropriate conditions specified in the Shoreline and Coastal Bluff Protection Ordinance. The existing Shoreline and Coastal Bluff Protection Ordinance will allow permits for the construction of seawalls, and other shoreline structures, when necessary to protect existing legally built structures if they are threatened with imminent danger (SBMC 17.62.020.A.1). Imminent danger is defined within the policy as "an occurrence that is reasonably foreseeable within 12 months from the time the determination of imminence is made." The Shoreline and Coastal Bluff Protection Ordinance also allows for shoreline protection structures in order to preserve the economically viable use of property if there are no other means of protecting it; and to abate a public nuisance when other methods of abatement, such as removing a structure, would result in severe economic effects to the property owner. Therefore, protection of residences using shoreline protection structures is allowed when bluff erosion causes a significant threat to housing, and the economic viability of the property.

Change in property value due to threatened structures would not be a consequence of the existing Shoreline and Coastal Bluff Protection Ordinance because it allows for protection of such structures. There would be no impacts to vacancy rates under this alternative and no significant impacts to housing.

Mitigation

Impacts to population and housing would be less than significant under this alternative; therefore, no mitigation is necessary.

Alternative 2 – Repeal of the Shoreline and Coastal Bluff Protection Ordinance

Under Alternative 2, the existing Shoreline and Coastal Bluff Protection Ordinance would be repealed and the California Coastal Commission would be solely responsible for approving any shoreline structures within the City in accordance with the California Coastal Act. Impacts under this alternative would be similar to the No Project Alternative because the California Coastal Commission has been the final permitting authority with the Shoreline and Coastal Bluff Protection Ordinance in place. The Coastal Act requires the California Coastal Commission to approve seawalls, revetments, and similar shoreline protection structures, in order to alter shoreline processes and protect existing structures. Therefore, under this alternative, there would be no significant impacts to population or housing.

Mitigation

Impacts to population and housing would be less than significant under this alternative; therefore, no mitigation is necessary.

Alternative 3 – Sand Replenishment and Retention Program

This alternative would involve continuous sand replenishment and retention projects and would not significantly increase employment levels or generate jobs within the City. Any jobs created by this alternative would not cause any significant redistribution of population within the region. Therefore, impacts to population would not occur.

Sand replenishment and retention would help provide a buffer between the bluffs that housing is situated upon and the tide line. Construction activities would be limited to beach areas below the bluffs for replenishment and offshore for retention structures. The housing supply would not increase or decrease as a result of this alternative. Impacts to housing would not result in reduced property value or increase in vacancy rates. Property values for bluff top residences may increase due to the enhancement of the beach and the resulting reduction of bluff top failures. Therefore, impacts to housing under this alternative would be insignificant.

Mitigation

Impacts to population and housing would be less than significant under this alternative; therefore, no mitigation is necessary.

<u>Alternative 4 – Planned Coastal Retreat Policy</u>

This alternative would include bluff top development regulatory policies that would establish setback lines based on estimated bluff erosion 50 and 100 years from now. No new development would be allowed seaward of the 50-year setback line for 50 years, and then the 100-year line would become the new "no new development" line for the remaining 50 years. The area is completely built out with no vacant parcels; however, improvements or additions to existing structures would also be limited by the setbacks. This alternative would also not allow old housing structures to be replaced by new structures seaward of an established "no new development" line. The current average erosion rate in the region is approximately 0.4 feet per year, or 27 to 40 feet per 100 years. At this current rate, the setback lines for 50 years and 100 years would be 20 and 40 feet, respectively. Many houses are currently set back approximately 10 to 15 feet at the most. Therefore, given the estimated setback lines and current erosion rates, in 50 years, most houses/condominiums would be located at least partially beyond the 50-year setback line.

This alternative would also require the purchase of the land and/or property seaward of the planned retreat lines as property becomes increasingly threatened and dangerous to inhabit. This alternative would have adverse long-term impacts to both population and housing because property values would decrease over time as setback lines and required property acquisition would place time restrictions on ownership. Therefore, under this alternative, impacts to population and housing would be significant.

Mitigation

Impacts to population and housing under this alternative cannot be fully mitigated to less than significant levels. However, to compensate homeowners for the loss of their property, the City, state, or other responsible agency could be required to purchase properties seaward of the "no new development" line at full market value. (For a description of the proposed mitigation measures, see the discussion of Alternative 4 at the end of section 3.2.2.)

In this context, it is important to understand that CEQA is concerned with physical impacts, not economic impacts on property values, as noted earlier. Thus, although CEQA could be read to require some sort of replacement housing, or a cash payment that would allow property owners to obtain such housing, the amount of financial compensation would be determined by factors other than the need for CEQA compliance. Replacement housing inland might provide square footage equivalent to what is lost in a bluff-top home, but might not be worth the same amount of money as the bluff-top home. Under principles developed in connection with the formal exercise of eminent domain and in case law dealing with inverse condemnation, full "fair market value" is the widely accepted measure of what constitutes fair compensation where governmental action has forced people to have to give up their homes. For reasons discussed in 2.4.1.1, however, it is not clear whether implementation of the Planned Retreat Alternative would constitute a "regulatory taking" requiring payment of full just compensation. In short, any decision by the City or the State, or both, to provide full compensation would be made not because such action is required by CEQA, but because such an approach strikes decisionmakers as fair and prudent, particularly in light of the uncertainties associated with any takings litigation that might ensue should the Planned Retreat Alternative be jointly implemented by the City and State.

3.6 Aesthetics

This section addresses the aesthetic resources of the existing natural and man-made environment of the 1.7-mile area subject to the Shoreline and Coastal Bluff Protection Ordinance. The scenic resources of the City's coastline are highly valued in terms of providing a pleasurable living environment, as well as attracting tourism to the area. Aesthetic resources in the area include scenic views from the upper bluffs, level views of the beach from the shoreline, and the natural seacliffs. Shoreline protective structures, such as seawalls, revetments, seacaves, and notch fills are also part of the existing setting.

3.6.1 Environmental Setting

Solana Beach is a popular visitor destination, characteristic of many scenic views of the Pacific Ocean and coastline. Public viewing areas are maintained along the shoreline at public coastal access points such as Tide Park, Fletcher Park, Seascape Surf, Del Mar Shores, and Las Brisas Viewpoint, above Fletcher Cove. Public views from the beach and shoreline are also important features evaluated in the area of study. In addition to bluff top viewpoints, the existing aesthetic setting includes the width of the beach and amount of sand coverage, the state of the coastal bluffs (natural conditions), and existing seawall structures along the bluffs.

Existing Goals, Objectives, and Policies

The Solana Beach General Plan addresses sensitive open space and viewsheds within the Open Space and Conservation Element. The following goals, objectives, and policies address viewsheds:

> *Goal 3.2* – To protect and enhance sensitive open space areas and viewsheds.
>
> *Objective 2.0* – Preserve the city's hillside areas and natural landforms in their present state to the greatest extent possible.
>
> *Policy 2.1* – The city shall enact a hillside development ordinance which contains development standards to: 1) maintain the natural visual character of the hillsides to the maximum feasible extent, …3) preserve significant visual and environmental elements, …8) encourage the use of innovative structural designs which adapt to the natural

topography, …10) require the blending of colors and materials with the hillside environment.

Objective 3.0 – Maintain the quality of scenic views in the city as well as the overall visual quality of the city's landscape.

Policy 3.b – The city shall require that new structures and improvements be integrated with the surrounding environment to the greatest possible extent.

The City of Solana Beach Draft LCP also addresses scenic and visual qualities of Solana Beach. Policy guidance for achieving objectives related to coastal visual resources from the California Coastal Act is incorporated into the LCP. In addition, Chapter 17.48 and 17.63 of the Solana Beach Municipal Code include specific regulations designed to protect coastal visual resources. Chapter 17.48 establishes the Overlay/Special Purpose zones, including the Scenic Area Overlay Zone (SAOZ). The purpose of the SAOZ is to regulate development in areas of high scenic value to preserve and enhance the scenic resources within and adjacent to such areas, as well as to ensure exclusion of incompatible uses and structures. The coastal bluffs are not within the SAOZ, but are within the Coastal Zone Boundary of the LCP. Chapter 17.63 requires assessment of the impact of proposed development on existing view and viewsheds by the City prior to approval of proposed development or redevelopment.

3.6.2 Environmental Impacts

3.6.2.1 Significance Criteria and Methodology

The visual impact assessment was conducted in accordance with the objectives and methods described in *the Visual Impact Assessment for Highway Projects*, Federal Highway Administration, March 1981. The Visual Impact Assessment was used to define the viewshed, viewer groups, and visual resource issues. The following steps were conducted for this assessment:

- define the visual environment and document existing landscape characteristics within the project viewshed;
- identify major viewer groups, and determine anticipated viewer response; and
- identify key views for the visual assessment, based upon representative viewer types and typical viewing conditions.

The *Visual Contrast Rating System* developed by the Bureau of Land Management was used to evaluate the various types of shoreline and coastal bluff protection alternatives. The existing bluffs, without any protective structures, were separated into two major features consisting of bluffs and vegetation (refer to Table 3.6-1). Each feature was then evaluated according to basic visual elements of form, line, color, and texture for degree of contrast – strong, moderate, weak, or none. This would provide a basis for comparison of compatibility and impact between the natural bluffs without and with the proposed alternative shoreline and bluff protection structures. The next step was to evaluate the various alternatives to shoreline and bluff protection using the same evaluation (see Table 3.6-2).

Table 3.6-1
Existing Cliffs

	Characteristic Landscape Description									
	Bluffs					Vegetation				
		Degree of Contrast[1]					Degree of Contrast[1]			
		Strong	Moderate	Weak	None		Strong	Moderate	Weak	None
Form	undulating cliffs	●				flat & undulating vegetation			●	
Line	vertical & horizontal		●			weak & undulating			●	
Color	light to medium tans some orange			●		medium to dark green		●		
Texture	coarse		●			coarse			●	

1. Degree of Contrast Criteria:
   - Strong — The element contrast demands attention, will not be overlooked, and is dominant in the landscape.
   - Moderate — The element contrast begins to attract attention and begins to dominate the characteristic landscape.
   - Weak — The element contrast can be seen but does not attract attention.
   - None — The element contrast is not visible or perceived.

Table 3.6-2
Visual Characteristics of Alternatives

Characteristic Alternatives Description																														
	No Project Proposal (Existing Ordinance) and Repeal of Shoreline and Bluff Protection Ordinance Alternative																				Sand Replenishment Alternative					Planned Coastal Retreat Policy Alternative				
	Seawalls					Seacave Fills/Plugs					Gunite Covering					Revetments (rocks, sandbags, & blocks)					Sand; Breakwaters, Reefs, & Groins									
		Degree of Contrast[1]					Degree of Contrast[1]					Degree of Contrast[1]					Degree of Contrast[1]					Degree of Contrast[1]					Degree of Contrast[1]			
		Strong	Moderate	Weak	None		Strong	Moderate	Weak	None		Strong	Moderate	Weak	None		Strong	Moderate	Weak	None		Strong	Moderate	Weak	None		Strong	Moderate	Weak	None
Form	geometric & angular	•				flat			•		flat		•			angular & irregular shapes			•		flat; angular & irregular shapes			•		none				•
Line	vertical & horizontal	•				weak & undula-ting			•		irregular lines created by edge effect of gunite cover-ing		•			angular			•		horizontal surface; angular		•			none				•
Color	light to medium tan			•		light gray & light to medium tan		•			very light tans		•			light, medium & dark grays			•		light tan; light, medium, & dark grays			•		none				•
Texture	fine to smooth			•		fine to smooth		•			smooth to coarse			•		coarse			•		fine; coarse			•		none				•

1.Degree of Contrast Criteria:
- Strong — The element contrast demands attention, will not be overlooked, and is dominant in the landscape.
- Moderate — The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- Weak — The element contrast can be seen but does not attract attention.
- None — The element contrast is not visible or perceived.

Visual Environment of the Study Area

Project Viewshed

The viewshed for the study area is defined as the surrounding geographic area from which the project is likely to be seen, based upon topographic and land use patterns. The outer viewshed limit for shoreline and coastal bluff protection is limited and is largely defined by the views from the beach with some limited views from private residences along the edge of the bluffs.

The eastern limit of the viewshed is the top of the bluffs and the western limit of the viewshed is the beach below. The city limits of Solana Beach define the north and south limits of the viewshed. Elevations range from sea level at the beach to approximately 75 feet MSL at the top of the bluffs. Shoreline and coastal bluff protection is most likely to be seen from beach below the bluffs. Views of shoreline and bluff protection structures would be limited to potential direct downward views from the edge of the bluffs toward shoreline and coastal bluff protection structures such as tops of seawalls, revetments, and gunite covering of the bluff slopes and sand retention devices such breakwaters, reefs, and groins. Sea plugs and fills would mainly be visible from the beach.

Landscape Components

One landscape unit has been defined within the project area and surrounding area because of the uniformity of the topography. This landscape unit is used to describe the existing visual setting and to analyze impacts on that setting.

Vegetation on the coastal bluffs is dominated by landscape plantings and backyard lawns.

Major viewer groups most likely to see the shoreline and coastal bluff protection structures would be beach visitors and existing bluff top residents. Viewers from the residences above the beach would be able to view the tops of seawalls, revetments, and gunite coverings from the bluff edge looking down toward the beach (refer to Figure 3.6-1).

3.6.2.2 Impact Assessment

Significant Visual Resource Issues

Shoreline and coastal bluff protection measures would require some modification to the existing shoreline and bluffs in order to provide shoreline and coastal bluff protection. Existing seacaves would be filled or plugged, and bluff faces would be covered with walls or gunite covering. Some existing ornamental and native vegetation could be removed. The total armoring of the coastal bluffs with seawalls or gunite covering could impact the continuity of the natural bluffs and the surrounding scenic value of the beach area. The armoring of the entire coastal bluffs with seawalls or gunite covering could visually interrupt the overall natural scale of

FIGURE

3.6-1

Existing Cliffs
Solana Beach

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the viewshed and decrease landform continuity cumulatively. This is considered a significant cumulative impact to visual resources. Various types of revetments, such as riprap (rock, stone, concrete block) and sand bags, would be temporary and used on a emergency basis and would not result in any long-term permanent or cumulative visual impacts to the bluffs or the viewshed. Alternative 1 – Continuation of the Existing Policy, would reduce the armoring of the entire bluffs by promoting the implementation of seacave plugging and filling over seawalls or gunite covering. Seawalls or similar structures pose a higher cumulative visual impact than would seacave plugs or fills; therefore, Alternative 2 would pose a higher cumulative visual impact.

Significant Viewer Response Issues

Views from the Beach

Views of the bluffs would not change significantly as a result of the proposed shoreline and coastal bluff protection alternatives. However, the natural appearance of the bluffs could change significantly depending upon the form, line, color, texture, and scale of the shoreline and coastal bluff protection structures built along the bluffs.

Views from Residences

Existing residents that live immediately adjacent to the bluffs might have a higher concern about the effect of proposed shoreline and coastal bluff protection and sand retention structures on downward views of the bluffs. The form, line, color, texture, and scale of the seawall structures could impact the quality of their views of the bluffs.

Visual Contrast Rating

The No Project Alternative and Repeal of the Shoreline and Coastal Bluff Protection Ordinance Alternative were analyzed together because both alternatives would allow construction of the same shoreline and coastal bluff protection structures, even though fewer seawalls would be built under the No Project Alternative, due to the City's proactive approach of encouraging notch and seacave fills and plugs in order to avoid the need for seawalls. As shown in Table 3.6-2, each type of structure was evaluated according to basic visual elements of form, line, color, and texture for degree of contrast – strong, moderate, weak, and none. Of the four types of shoreline and coastal bluff protection structures, seawalls would have the greatest significant visual impact on the existing bluffs due to their strong form and line elements in contrast to the bluffs (refer to Figure 3.6-2). Fills and plugs of seacaves do not pose a significant visual impact; however, they are somewhat visible due to the moderate contrast of their colors and texture against the existing bluffs (refer to Figure 3.6-3). Gunite covering, although not as strong a contrast in form and line elements, would pose a significant visual impact because of the moderate degree of contrast from its form, line, and color against the existing bluffs as shown in Figure 3.6-4. Revetments would not pose a significant visual impact because they would be used on a temporary basis in emergency situations and the natural material, such as rock and concrete blocks, does not attract as much attention as the other permanent structures mentioned above (refer to Figure 3.6-5).

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FIGURE

3.6-2

Typical Sea Walls

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FIGURE

3.6-3

Typical Sea Cave Fills/Plugs

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FIGURE

3.6-4

Typical Gunite Covering

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FIGURE

3.6-5

Typical Revetments

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Alternative 1 – No Project – Continuation of Existing Policy

Alternative 1 promotes the implementation of seacave plugging and filling over the construction of seawalls, bluff retaining walls, gunite covering, and similar permanent armoring for shoreline protection. Alternative 1, therefore, reduces the direct visual impacts associated with the implementation of seawalls or gunite covering to below a level of significance. The City's Shoreline and Coastal Bluff Ordinance takes a more proactive approach in reducing erosion of the bluffs and minimizes the visual effects that could result in a future need to construct a more intrusive device such as a seawall. The details regarding how the Ordinance addresses visual impacts are described below. Examples of "typical sea cave fills/plugs" are shown in Figure 3.6-3. Although in the long-term the entire coastal bluffs would probably be covered with a combination of seawalls, gunite, and seacave infills; for CEQA purposes, a worst case scenario was considered where the predominant coastal bluff protective device would consist of seawall or gunite covering. Because the City's ordinance does not mandate the implementation of seacave plugging and filling over seawalls or gunite covering, significant cumulative visual impacts associated with armoring the entire coastal bluffs with seawalls or gunite covering could result even with mitigation (see Section 4.0).

Mitigation

Visual Impacts and Impact Management

Significant visual impacts would include an increase in incompatible elements such as form, line, color, and texture introduced onto the bluffs from the construction of seawalls, gunite covering, and seacave fills and plugs. The sharp and angular forms and lines from some seawalls result in a high contrast against the natural, undulating bluffs. Gunite covering results in a moderate degree of contrast due to its flat form and vegetation. The color and textures of some seacave fills and plugs result in a moderate contrast to the bluffs. The addition of future shoreline and coastal bluff protection structures along the bluffs could result in significant cumulative visual impacts.

The City's Shoreline and Coastal Bluff Ordinance (Alternative 1) requires the following measures in order to reduce visual impacts to the existing bluffs from the construction of shoreline and coastal bluff protection devices:

- Construct and maintain structures to incorporate an earth-like appearance, which will resemble as closely as possible the natural color and texture of the adjacent bluffs.

- Construct and maintain structures to reasonably conform to the natural form of the bluff.

Appropriately landscape and maintain structures to blend in with the existing environment.

- Design seacave plugs and fills with a "leaner" cement mix on the external façade and a "stronger/greater" mix internally to facilitate plug erosion to match the rate of natural erosion of the adjacent coastal bluff. The external facade will resemble as closely as possible the natural color and texture of the adjacent bluffs and be of sufficient depth to replicate the retreat of the adjacent bluff due to weathering anticipated to be experienced over the next 75 years.

- Landscape shall encourage the use of native vegetation that thrives on seasonal rain and natural coastal moisture, and require minimum watering.

These requirements already ensure that, for purposes of the No Project Alternative, the visual impacts of notch and seacave plugs and fills are already mitigated to less than significant levels. Such measures, however, are not similarly effective with respect to the visual impacts of seawalls and gunite covering. The following measures would further mitigate the effects of notch and seacave fills/plugs, and would reduce to less than significant levels the direct visual impacts of seawalls and gunite covering:

Seawalls should be designed and constructed with:

- natural-looking facades with undulating forms and lines
- coarse textures

Gunite covering should be designed and constructed with:

- undulating form and lines
- addition of planting pockets consisting of native vegetation to blend in with existing adjacent vegetation
- coarse textures

Seacave fills and plugs should be constructed with:

- undulating form and lines
- coarse textures

These recommendations would be consistent with the City's draft LCP and General Plan, Open Space and Conservation Element goals, objectives, and policies to protect and enhance sensitive open spaces and viewsheds.

Alternative 2 - Repeal of the Shoreline and Coastal Bluff Protection Ordinance

Alternative 2 would not promote the implementation of seacave plugging and filling over the construction of seawalls, bluff retaining walls, gunite covering, and similar permanent armoring for shoreline protection. Alternative 2, therefore, would result in significant direct visual impacts associated with the implementation of seawalls or gunite covering. Future approvals for shoreline protection would not be reviewed by the City under its current ordinance, which prefers seacave plugging and filling; therefore, approval of shoreline protection would proceed directly to the California Coastal Commission and would likely result in armoring the entire natural coastal bluff. Examples of seawalls can be seen in Figures 3.6-2. Significant cumulative visual impacts could result from armoring the entire coastal bluffs with seawalls or gunite covering (see Section 4.0).

Mitigation

Similar mitigation measures, as described above under Alternative 1, would reduce visual impacts to the existing bluffs from the construction of shoreline and coastal bluff protection devices to less than significant levels, with the exception of long-term cumulative impacts associated with the total armoring of the coastal bluffs. All existing mitigation measures required by the City's Ordinance and additional recommended mitigation measures described above would need to be implemented by the Coastal Commission.

Alternative 3 – Sand Replenishment and Retention Program

No significant visual resource impact issues are anticipated with the addition of sand to the beach area because sand is an existing and natural component of the viewshed area; therefore, no mitigation would be required. Although sand retention devices such as breakwaters, reefs, and groins would be visible above the MLLW, these devices are constructed of natural materials such as sand, stone, or cobble and would not pose a significant visual impact. The addition of sand would not pose any significant visual impact to the bluffs (refer to Table 3.6-2).

Mitigation

Impacts to visual resources under this alternative would be less than significant; therefore, no mitigation is necessary.

Alternative 4 – Planned Coastal Retreat Policy

No significant visual resource impact issues are anticipated with allowing the seacliffs to naturally erode from continued wave action and allowing the landward boundary of the beach to occur naturally; therefore, no mitigation would be required. Short-term, temporary visual impacts could result from residences that collapse as a result of bluff failure.

Mitigation

Impacts to visual resources under this alternative would be less than significant; therefore, no mitigation is necessary.

3.7 Utilities and Service Systems

3.7.1 Environmental Setting

This section identifies the location of existing utilities and service systems within the study area. The description is based on field surveys of the Solana Beach shoreline and Pacific and Sierra Avenues.

<u>Existing Conditions</u>

Existing utilities in the immediate study area include access stairs and ramps, and storm drainpipes. Other utilities located inland from the houses along the bluffs include overhead and underground telephone and power lines, underground sewer, cable and water lines, and the streets themselves (Pacific Avenue north of Fletcher Cove and Sierra Avenue south of Fletcher Cove). Utilities along Pacific Avenue were installed mainly between the late 1920s and mid-1950s and include overhead telephone and power lines. The majority of utilities utilized for Sierra Avenue residents are underground and were installed in the 1970s. There are two major storm drainpipes that discharge onto the beach. One storm drainpipe is located adjacent to the public access stairway at Seascape Surf and runs along the slope of the seacliff, eventually cutting into the upper bluff. The steel pipe is approximately 2 feet in diameter and discharges approximately 9 to 10 feet above MSL. The other outlet is located between the public access stairs adjacent to Del Mar Shores Road and the private condominium access stairs to the south. The outfall is an opening within a seawall structure, approximately 2 feet in diameter, and 2 to 3 feet above MSL. Existing access stairs and ramps are described in Section 3.4.

3.7.2 Environmental Impacts

3.7.2.1 Significance Criteria and Methodology

Impacts to utilities and service systems would be considered significant if they would:

- result in the displacement or degradation of existing systems;
- result in the demand for new systems; and
- significantly alter the state of existing systems.

3.7.2.2 Impact Assessment

<u>Alternative 1 – No Project - Continuation of Existing Policy</u>

Under the continuation of the existing policy, shoreline structures would continue to be permitted under specific criteria and there would be no direct impact to the existing storm drainpipes. One drainpipe outlets through an existing seawall and would remain unaltered. The storm drainpipe at Seascape Surf runs along and into an unprotected bluff. If a seawall or shoreline structure were eventually placed on this section of the bluff, it could accommodate the outfall and potentially help secure it further onto the bluff. Any utilities such as underground or overhead sewer, water, power, or telephone lines, which are located landward of the residences along Pacific Avenue and Sierra Avenue would not be impacted under this alternative. Therefore, there would be no significant impacts under the No Project Alternative.

Mitigation

Impacts to utilities and service systems under this alternative would be less than significant; therefore, no mitigation is necessary.

Alternative 2 – Repeal of the Shoreline and Coastal Bluff Protection Ordinance

Impacts under this alternative would be similar to the No Project Alternative. Therefore, there would be no significant impacts to utilities and service systems under this alternative.

Mitigation

Impacts to utilities and service systems under this alternative would be less than significant; therefore, no mitigation is necessary.

Alternative 3 – Sand Replenishment and Retention Program

The storm drainpipe outlet at Seascape surf is elevated enough so that it would not be impacted by beach fill. The drainpipe that extends out of an existing seawall is low enough to the MSL line that beach fill could potentially obstruct it. However, drainage could be maintained from the outfall to the ocean by excavating a channel. No impacts to any other utilities or systems would occur under this alternative. Therefore, no significant impacts would occur.

Mitigation

Impacts to utilities and service systems under this alternative would be less than significant; therefore, no mitigation is necessary.

Alternative 4 – Planned Coastal Retreat Policy

Bluff top development and regulatory policies would establish setback lines on the bluff tops of “no new development” based on anticipated erosion rates, 50 years from implementation. This policy is based on the notion that the process of bluff erosion will be allowed to continue to occur with limited shoreline protection structures. Therefore, in the long term, impacts to utilities and service systems within Pacific and Sierra Avenues would eventually be significant through increased exposure (underground utilities) and potential displacement (overhead and underground utilities).

Acquisition of property could result in a slight decrease in demand for utilities and service systems. However, the relatively small number of residences affected compared to regional population would not result in significant impacts on utility consumption patterns.

Mitigation

Mitigation to reduce impacts on utility systems to less than significant levels shall include:

- Relocation of underground and overhead utilities on Pacific and Sierra Avenues.

4.0 CUMULATIVE IMPACTS

This chapter evaluates the cumulative impacts that could result from the implementation of each of the project alternatives as required by CEQA Guidelines for MEIRs (§ 15175). This MEIR is evaluating four broad policy and program alternatives, and is, therefore, required to discuss the potential cumulative impacts associated with each alternative and subsequent projects.

By definition and according to CEQA, cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. That is, the cumulative impact of several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and/or reasonably foreseeable, probable future projects. Cumulative impacts can result from individually minor, but collectively cumulative projects taking place over a period of time.

According to revisions made to the CEQA Guidelines in 1998, a lead agency may determine that a project's contribution to a cumulative impact is not "cumulatively considerable" if the project will comply with the requirements in a previously approved plan or mitigation program that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located. (CEQA Guidelines, § 15064, subd. (i)(3).). Similarly, a lead agency may determine that the incremental impacts of a project are not "cumulatively considerable" when they are so small that they have a *de minimus* contribution to a significant cumulative impact caused by other projects that would exist in the absence of the proposed project. A *de minimus* contribution means that the environmental conditions would essentially be the same whether or not the project is implemented. (CEQA Guidelines, §§ 15064, subd. (i)(4), 15130, subd. (a)(4).) Although the specific Guidelines provisions articulating these principles are currently under attack in an appeal pending in the Third District Court of Appeal in Sacramento (*Communities for a Better Environment et al. v. California Resources Agency*, Case No. C038844), no party in that case, to the City's knowledge, is questioning the general principle that, in some instances at least, a very small incremental contribution to a larger cumulative problem can be effectively mitigated by compliance with policies in an adopted plan that effectively render that incremental contribution to a level that is "less than cumulatively considerable." (See CEQA Guidelines, § 15130, subd. (a)(3); *Save Our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal.App.4th 99, 140.) Furthermore, the pending appeal does not involve CEQA provisions dealing with MEIRs, which contemplate that, where such documents properly cumulative impacts, future environmental documents need not address those same issues again. (CEQA Guidelines, §§ 15176 - 15178.)

Consistent with those provisions dealing with MEIRs, this chapter will evaluate the potential cumulative impacts that may be associated with each alternative and subsequent projects discussed in this MEIR when combined with other past, present, and reasonably foreseeable future actions undertaken by the same or other agencies, private parties, and/or persons. The affected environment is described first, followed by a general discussion of the potential cumulative impacts that could be anticipated.

4.1 Affected Environment

Although some persons might argue that the geographic scope of a proper cumulative impact analysis (i.e., cumulative area of potential effect) for the matters at hand should extend throughout the entirety of the Oceanside Littoral Cell, the City has determined that any attempt to analyze such a large geographic area would create practical problems and would tend to minimize the relative contributions of projects approved along the City's 1.7 mile coastline. In addition, as a practical matter, it would be very difficult and speculative to even try to determine the incremental effects of these alternatives in such a large physical context, given the myriad of policies, projects, and programs currently being evaluated for implementation along this very considerable stretch of coastline. For these reasons, this cumulative impact analysis focuses on the past, present, and foreseeable future relevant coastal projects within the City of Solana Beach and the immediate adjacent communities of Encinitas to the north and Del Mar to the south. Detailed below is a general description of the existing conditions of the coastlines of the communities of Encinitas and Del Mar. Solana Beach's conditions have already been discussed in the individual affected environment sections for each of the resource areas as presented in Chapter 3.

Encinitas. Encinitas to Cardiff State Beach includes a stretch of approximately 3.6 miles of shoreline north of Solana Beach. The upper 0.9-mile section of bluff top is heavily developed and has a history of cliff and slope stability problems. The sand and cobble beach is very narrow and is backed by a steep wave-cut cliff ranging in height from 30 to 80 feet. Cardiff is characteristic of cobble berm and beach and is susceptible to surficial failures and erosion due to steep slopes. The most southern section of shoreline bordering the San Elijo Lagoon is approximately 1.3 miles long and protected by a rock and concrete rubble revetment and portions of a deteriorated concrete seawall. This section is a narrow beach with excellent access in the summer months (Flick, 1994).

Del Mar. Del Mar includes a stretch of approximately 2.6 miles of shoreline south of Solana Beach. The upper 1.1 miles is generally a wide beach that is largely used for recreation, provides good beach access, and provides protection for the dense low-lying residential development in this section. This area is heavily armored with protective structures such as seawalls, bulkheads, and riprap, many of which have been damaged by high winter waves. The southern section of 1.5 miles is a narrow sandy beach, backed by almost vertical, 60- to 100-foot-high seacliffs. Shoreline protection is minimal in this area with the exception of protection for the railroad bench cut into the face of the upper cliff face. The cliff top is almost totally built out with residential housing and beach access very poor and limited (Flick, 1994).

In addition to the above mentioned existing conditions of the coastlines in the communities of Encinitas, Del Mar, and Solana Beach, this analysis includes one or more aspects of other policies, projects, and/or programs that are similar to each of the alternatives with respect to their type, nature, location, and/or the environmental resources they may affect. The scope of this cumulative analysis includes other coastline policies, programs, and private and public projects in the communities of Encinitas, Solana Beach, and Del Mar that:

- Have direct impacts on one or more elements of an alternative(s).
- Affect the shoreline, beach, and/or cliff erosion rates.
- Involve the construction of structural measures along the coastline.
- Have received budget and/or construction approval.
- Have gone through or are currently undergoing environmental review.
- Are not built but are included in the General Plan, including those projects anticipated as later phases of a previously approved project.

Several related or relevant policies; past, present, and/or reasonably foreseeable future projects; and/or programs have been identified and are included in this cumulative impact analysis. These include the following:

Draft Policy on Coastal Erosion Planning and Response, The Resources Agency of California, March 26, 2001. The Resources Agency has prepared a model for policy guidance about the approach that boards, commissions, conservancies, and departments within the Resource Agency should consider in addressing coastal erosion and beach loss along the California coast. It is a model policy document that may apply to developing projects, authorizing private or public projects, or commenting on permit actions taken by other authorities, including federal, state, and local government agencies. The Draft Policy could also be useful in efforts to assist the public, private sector, government agencies or other interested parties in better understanding the general approach that these departments may pursue. This policy is in the process of being revised and will be circulated for public comment in the near future. Examples of agencies who would use this policy include:

- The Department of Boating and Waterways is California's primary agency responsible for working to restore eroded beaches and protecting public coastal infrastructure. The department is responsible for administering the California Public Beach Restoration Program. The mission of the program is to preserve and protect the California shoreline by restoring and maintaining natural and recreational beach resources and minimizing economic losses caused by natural and human-induced beach erosion.

- The California Coastal Commission is California's primary agency responsible for carrying out the California coastal management program assigned through the California Coastal Act. The California Coastal Commission plans for and regulates development in the coastal zone consistent with the policies of the California Coastal Act.

- State Coastal Conservancy complements the California Coastal Commission through coastal land acquisition and resource restoration and enhancement programs. The Coastal Conservancy uses entrepreneurial techniques to purchase, preserve, improve, and restore public access and natural resources along the California coast. The Conservancy has authorized numerous grants and funding for projects in the San Diego region to include:

- ✓ In September 2000, $280,000 to retain technical specialists for studies on the prevention of beach erosion on a regional basis and the reestablishment of natural sand supply and to help in the design of a habitat conservation study for the San Diego regional sand project.

- ✓ In August 2000, $67,000 to the San Elijo Lagoon Conservancy to assess the sediment quality and depositional patterns of San Elijo Lagoon in San Diego County.

- ✓ In October 2001, $224,000 to the San Elijo Lagoon Conservancy to remove invasive non-native plants from around the perimeter of San Elijo Lagoon and re-establish native species as necessary.

- ✓ In September 2001, $250,000 to the Los Peñasquitos Lagoon Foundation to conduct a hydrology and sediment control study for the Los Peñasquitos Lagoon and Watershed, San Diego County.

- Department of Parks and Recreation manages the State Park System. The department's mission is to help preserve the state's extraordinary biological diversity, protect its most valued natural and cultural resources, and create opportunities for high quality outdoor recreation. In addition, the department administers grants to local governments for acquiring and developing public property for parks and recreation purposes.

- State Lands Commission is responsible for managing and protecting State-owned Sovereign lands and reversionary rights in legislatively granted lands, including mineral resources and mineral rights.

- Department of Fish and Game is responsible for determining the impacts to fish and wildlife for any activities related to shoreline development.

California Coastal Sediment Management Workgroup (CSMW). CSMW is a statewide effort initiated by both the U.S. Army Corps of Engineers and the California Resources Agency in late 1999 and was established to meet the challenges of addressing shoreline erosion. The CSMW is the first state and federal partnership developed in California for on-going, multi-agency dialogue and interaction on statewide coastal sediment management issues, such as the use of federal and state funds and project coordination. The group's goal is to facilitate regional approaches to protection, enhancing, and restoring California's coastal beaches and watersheds through federal, state, and local cooperative efforts. The CSMW has been helpful in providing a forum to begin developing regional approaches to shoreline erosion in California.

California State FY 2002-03 Budget – Encinitas/Solana Beach Restoration. The Public Beach Restoration Act (AB-64) created a state fund for sand replenishment projects. The state has proposed $6.5 million for beach restoration projects as part of its FY 2002-03 budget, of which,

$400,000 has been proposed for an Encinitas/Solana Beach Restoration project (CalCoast 2002).

Regional Beach Sand Retention Strategy, SANDAG, October 2001. SANDAG has prepared a sand retention strategy in order to assess and take advantage of the potential benefits of sand retention as part of the adopted Regional Shoreline Preservation Strategy in 1993. The Regional Beach Sand Project (2001) was the first step towards restoring the region's sandy coastline. SANDAG is working on a program to pay for and carry out additional beach replenishment projects to continue this effort.

SANDAG Beach Replenishment Project. This project was completed in the late summer of 2001. The project placed approximately 2 million cubic yards of sand on beaches from Oceanside to Imperial Beach. Approximately 140,000 cubic yards of sand was placed on Solana Beach as part of this project. A joint EIR/Environmental Assessment (EA) was prepared to analyze the potential impacts associated with the dredging and placing of approximately 2 million cubic yards of sand on a maximum of 13 receiver sites in the San Diego region, which included Solana Beach. Two alternatives with some construction time variations and a No-Action alternative were analyzed for potential environment impacts relating to geology and soils, coastal wetlands, water resources, biological resources, cultural resources, land and water use, aesthetics, socioeconomics, public health and safety, structures and utilities, traffic, air quality, and noise. The Final EIR/EA was completed and no long-term significant impacts were identified; however, a post-construction monitoring plan is being implemented to verify that no significant impacts to marine biological resources, lagoons, and underwater archaeological resources would occur.

City of Solana Beach Draft Local Coastal Plan. The City of Solana Beach has prepared a Draft LCP that was submitted to the California Coastal Commission in 2001. The California Coastal Commission provided comments on the plan and completion is expected in 2000.

The City of Encinitas Moonlight Beach Replenishment. The City of Encinitas provides annual beach replenishment of approximately 1,000 cubic yards of sand in the spring.

San Elijo Lagoon Dredging. The mouth of San Elijo Lagoon is dredged to maintain the opening on an as-needed basis. Approximately 6,000 cubic yards of material is typically placed south of the mouth of the Lagoon.

Fletcher Cove Replenishment. In the spring of 1999, approximately 51,000 cubic yards of sand was placed at Fletcher Cove as a result of the Lomas Santa Fe Grade Separation Project.

Fletcher Cove Master Plan. Redevelopment of Fletcher Cove Beach Park is proposed to occur in the 2001-2002 timeframe. The project would entail the construction of a parking garage, a new lifeguard station, additional open space, pedestrian paths, and other upgrades.

Seacave Fill at 141 and 197 Pacific Avenue, Solana Beach. Permit pending California Coastal Commission approval (Application No. 6-00-66) with conditions to fill sea cave with colored and textured erodible concrete at base of sea cliff below two residential lots, at 141 and 197 Pacific Avenue, Solana Beach, San Diego County.

Concrete Seawall at 310 Neptune Avenue, Encinitas. Permit pending California Coastal Commission approval (Application No. 6-01-159) for a 40 foot-long 13-foot-high 27-inch-thick tiedback concrete seawall incorporating two rows of 30 foot-long rock anchors, on public beach below 310 Neptune Avenue, Encinitas, San Diego County.

Concrete Seawall at 252 and 258 Neptune Avenue, Encinitas. Permit pending California Coastal Commission approval (Application No. 6-01-160) for 80 foot-long 13 foot-high 27-inch-thick tiedback concrete seawall incorporating two rows of 30 foot-long rock anchors, on public beach below 252 and 258 Neptune Avenue, Encinitas, San Diego County.

Concrete Seawall at 794, 796, and 798 Neptune Avenue, Encinitas. In January 2002, the California Coastal Commission approved with conditions Application No. 6-00-74 for 156-foot.-long 17-foot-high 27-inch-wide tiedback colored and textured concrete seawall, at 794, 796, and 798 Neptune Avenue, Encinitas, San Diego County.

Seawall at 371 Pacific Avenue, Solana Beach. An alternative for a use permit to construct a seawall at the base of the sea cliff below 371 Pacific Avenue, along with minor upper-bluff reconstruction is being considered by the City of Solana Beach. The bluff-top property is located approximately 1,700 feet northerly of Fletcher Cove along a relatively linear section of coastline extending southerly of Tide Beach Park, where significant sea-cliff retreat has undermined and destabilized a significant portion of this section of coastline. Other alternatives to the proposed seawall will be considered such as rock rip rap; below-grade upper bluff retention system; groundwater controls, irrigation restrictions, and drought-tolerant planting; underpinning; chemical grouting; and relocation of structure. The proposal is under environmental review and determination of impacts has not been identified to date.

Construct Notch Infill, Infill Two Seacaves, and Rehabilitate Six Existing Seacave Infills at 523 and 525 Pacific Avenue, Solana Beach. A Mitigated Negative Declaration was prepared to analyze the construction of a notch infill, the infill of two seacaves, and rehabilitation of six existing seacave infills at 523 and 525 Pacific Avenue in Solana Beach. No significant impacts were identified with the implementation of mitigation measures.

Shotcrete Seawall in Encinitas. A proposal to construct a 22-foot high and 110-foot long shotcrete lower bluff seawall in the City of Encinitas adjacent to 633 Circle Drive in Solana Beach is being considered.

4.2 Cumulative Environmental Impacts

This section discusses the potential cumulative impacts that may be associated with each alternative and subsequent projects discussed in this MEIR when combined with other past, present, and reasonably foreseeable future actions as identified above that may be undertaken by the same or other agencies, private parties, and/or persons. This discussion of cumulative environmental impacts is very general because of the speculative nature of how each of the four policy-based alternatives may affect other policies, projects, and programs that are also not precisely defined. The discussion is guided by standards of practicality and reasonableness and therefore focuses on the potential cumulative impacts that may occur and broad/general mitigation measures such as adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis. In addition, this discussion is structured by discussing the cumulative impacts by each alternative and subsequent projects rather than by resource or by foreseeable policies, projects, or programs.

No Project Alternative – Continuation of Existing Policy

The No Project Alternative has cumulative impacts by nature because it is an existing policy that would involve continuous permitting and construction of shoreline protective structures, with the potential for the entire City's shoreline to become armored. Cumulative aesthetic impacts due to the armoring of the region's coastal bluff with seawalls or gunite covering would not be mitigated to below a level of significance.

As discussed in Sections 3.1 and 3.6, Alternative 1 reduces geologic/soils and visual cumulative impacts, respectively, by promoting the implementation of seacave plugging and filling over the construction of seawalls, bluff retaining walls, gunite covering, and similar permanent armoring for shoreline protection. The City's Shoreline and Coastal Bluff Ordinance takes a more proactive approach in reducing erosion of the bluffs and minimizes effects that could result in a future need to construct a more intrusive device.

Repeal of Shoreline and Coastal Bluff Protection Ordinance Alternative

Cumulative aesthetic impacts associated with this Alternative would not be mitigated to below a level of significance. As mentioned above, cumulative geologic/soils and visual impacts would increase as a result of this Alternative because the potential of armoring the region's entire coastal bluff with seawalls is higher under this Alternative.

Sand Replenishment and Retention Program Alternative

Sand replenishment and retention projects at Solana Beach would not have significant impacts alone. Retention structures could potentially have impacts to downdrift beaches. Negative impacts to downcoast beaches and lagoon inlet channels could occur from the placement of structures that intercept sand traveling south and the buildup of sand at lagoon mouths. Design features such as pre-filling the updrift beach and short groin fields that allow sand to bypass and flow downdrift would lessen this impact. However, these mitigation measures would not reduce cumulative impacts to less than significant levels. This alternative, in addition to the listed projects and policies in the area, would create significant impacts in Solana Beach, Encinitas, or Del Mar. Sand replenishment by nature has beneficial impacts to a receiver site. Further, this alternative would have beneficial impacts to bluff erosion, as sand replenishment and retention would reduce the rate of coastal bluff erosion. Overall, this alternative combined with other projects considered in this cumulative impact assessment would result in significant cumulative impacts.

Planned Coastal Retreat Policy Alternative

This alternative would have significant cumulative impacts to residential land use and population and housing in Solana Beach, as discussed in the relevant sections of this MEIR. This alternative also would increase the potential for erosion, large-scale landsliding, and soil failure. Even with these protections in place, lifeguard and public safety issues would be increased and would result in a significant public safety impact with this alternative. As bluffs crumbled or otherwise gave way to the forces of coastal erosion, people along the beach would be exposed to the risk of injury or possibly even death. Therefore, when combined with projects considered in this cumulative impact assessment, this alternative would result in significant cumulative impacts.

5.0 GROWTH-INDUCING IMPACTS

Section 15126.2(d) of the CEQA Guidelines requires a discussion of ways in which the proposed project and alternatives could foster economic or population growth, or the construction of additional housing, whether directly or indirectly, in the surrounding environment. This MEIR will assess potential growth-inducing impacts of each alternative and subsequent projects. Induced growth is distinguished from the direct employment, population, or housing growth of a project. If a project has characteristics that "may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively," then these aspects of the project must be discussed as well. Induced growth is any growth that exceeds planned growth and results from new development that would not have taken place in the absence of the proposed alternative. The CEQA Guidelines also indicate that the topic of growth should not be assumed to be either beneficial or detrimental.

The No Project Alternative would involve the continuation of the existing policy, which allows for limited permitting of seawalls, revetments, seacave notch infills, and other shoreline structures. These projects are for the benefit of the existing population and more specifically the existing homeowners with shoreline fronting property; they do not contribute to growth locally or regionally. The bluff tops are currently built out; therefore, any shoreline protection structure allowed under this policy would be for the protection of an existing structure or home. Further, the population has remained the same since the Shoreline and Coastal Bluff Protection Ordinance was implemented in 1994, and therefore would not have any growth-inducing impacts in the future.

Alternative 2 would have similar impacts as the No Project Alternative. Shoreline protection structures permitted through the California Coastal Commission would also be at the request of existing homeowners in Solana Beach and would not induce growth.

Alternative 3 would involve sand replenishment and retention activities, which would help maintain recreational opportunities at Solana Beach. As a result of sand replenishment, beach use would likely remain at existing levels. Even if beach use were to increase slightly, this would have no discernable effect on growth in the area. The City is virtually built out already. Even if improved beach conditions, by making the City a more attractive place to live or visit, might draw additional people to the area, the resulting environmental impacts associated with that increase are too speculative to be able to quantify or predict without speculation.

Alternative 4 would involve the gradual loss of residences along the bluff top, and eventually a potential decrease in the current population. Therefore, this alternative would not have growth-inducing impacts, but potentially would have the opposite effect of a reduction in population within the City. Although displaced residents would have to move elsewhere, it is impossible to predict where they might go. The number of people involved, moreover, is not large enough to create any growth pressures in areas in San Diego County that are not currently developed.

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6.0 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Section 15126.2(b) of the CEQA Guidelines requires a description of any significant adverse impacts resulting from a project, including impacts that cannot be mitigated to below a level of significance. Each alternative and subsequent projects were evaluated with respect to specific resource areas to determine whether implementation would result in significant adverse impacts.

Specific significance thresholds were defined for each potential impact associated with the resource areas of geology and soils, land use, biological resources, recreation and public access, population and housing, aesthetics, and utilities and service systems. Mitigation measures were developed for alternatives to reduce impacts to below a level of significance.

The No Project Alternative and subsequent projects would have significant long-term impacts to recreation and lateral public access from the construction of seawalls and seacave notch fills and aesthetics from the construction of seawalls. Mitigation measures were developed for aesthetics under this alternative, which, if implemented, would reduce impacts to less than significant levels. Continuous sand replenishment – similar or identical to what is proposed in connection with Alternative 3 -- would be the only feasible mitigation to reduce impacts to recreation and lateral public access to less than significant levels. These same impacts would apply to Alternative 2. However, long-term recreation, lateral public access, and aesthetic impacts would be more severe with Alternative 2 because there is a greater tendency to build seawalls under the California Coastal Commission's permit process. For Alternative 3, the SANDAG Draft EIR found that all of the potential impacts associated with sand replenishment can be mitigated to below levels of significance and are not considered significant or unavoidable. The Regional Beach Sand Retention Strategy report prepared by SANDAG (SANDAG 2001b) proposes mitigation measures which could be used to reduce potential significant impacts associated with sand retention devices. Unavoidable adverse impacts associated with sand retention structures include the potential permanent loss of low and high relief reef habitat and displacement of fish species, as discussed in Section 3.3. Specific technical studies would be required to fully assess the unavoidable adverse impacts associated with a specific sand retention project. Alternative 4 would have unavoidable significant impacts associated with land use and housing and population, which cannot be mitigated to below a level of significance.

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7.0 IRREVERSIBLE CHANGES AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Section 15126(c) of the CEQA Guidelines requires an EIR to address any significant irreversible environmental changes and irretrievable commitment of resources that may occur as a result of alternative implementation. This includes use of nonrenewable resources, the commitment of future generations to similar uses, and irreversible damage, which can result from environmental accidents associated with the project.

Irreversible changes associated with Alternative 1 and subsequent projects would eventually involve the potential armoring of the entire length of the City's shoreline. This would include the alteration of the natural environment in currently unarmored areas, and potential loss of recreational opportunities. Construction of protective structures would involve some building materials, nonrenewable energy sources, and labor required to operate trucks, machinery, and other equipment. However, this alternative and subsequent projects would not use a substantial amount of resources at one time, but would require resources periodically over a long period of time. Alternative 2 is considered to have the same irreversible changes and irretrievable commitment of resources as the No Project Alternative.

Alternative 3 would result in the placement of 140,000 cubic yards of dredged beach fill material. This alternative and subsequent projects would also include offshore construction of sand retention structures. These activities would result in consumption of nonrenewable energy sources and labor to operate trucks, pumping equipment, grading equipment, and any other necessary machinery associated with retention projects. Depending on funding to continue sand replenishment and retention projects, this alternative would not use a substantial amount of resources in the short term. However, long-term continuation of sand replenishment and retention projects would require continuous labor and nonrenewable energy sources. Sand retention projects would also require offshore marine resources to be permanently altered by implementing structures. Other sources of material for sand replenishment and retention structures include: (1) dredging sand from behind dam sites, (2) removing dams that interrupt river-borne sediment, or (3) terminating regional sand mining activities. The need for local water supplies and sand and aggregate resources would make it infeasible to remove dams and terminate sand mining activities respectively.

Alternative 4 would involve alteration of the human environment through eventual permanent loss of residential land use and housing and population resources. These losses would have potential implications for commitments of resources such as labor and nonrenewable energy resources required for the deconstruction and removal of housing structures as they become increasingly threatened by erosion.

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8.0 EFFECTS NOT FOUND TO BE SIGNIFICANT

Section 15128 of the CEQA Guidelines states that an EIR shall contain a brief statement indicating the reasons why various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the MEIR. During the scoping process for this MEIR, it was determined that the MEIR would be focused on specific resource areas based on the reasoning that it assesses an existing policy and alternative policies and programs, which are vast and not project specific. Certain resources would be too speculative to analyze without a specific proposed project. Resource areas that were not analyzed because they were not deemed to have the potential to result in significant impacts are air quality, cultural resources, hazards and hazardous materials, hydrology and water quality, mineral resources, noise, public services, and transportation.

No long-term air quality impacts are anticipated with proposed subsequent projects of the alternatives. Proposed subsequent projects would only generate limited construction traffic over a limited period of time. Subsequent projects of Alternatives 1, 2, and 3 would be located either on the beach, at the base of coastal bluffs, or in the ocean, where no evidence exists that these areas contain any important historical, paleontological, archaeological resources or human remains. Proposed subsequent projects would not create a public safety impact relating to hazardous materials. During construction, there would be vehicles using fuels and oils that could possible deposit small amounts through weeping or other incomplete seals. These amounts will be very limited, if any, and would not cause any hazards to the public. Proposed subsequent projects of the alternatives would not impact water quality or water resources and would not increase any existing flooding problem or expose people or habitable structures to flooding action. No known mineral resource of value or locally important mineral resource recovery site exists in Solana Beach; therefore, subsequent proposed projects would not impact mineral resources. Construction noise associated with any subsequent proposed project would be short-term and less than significant. During construction of subsequent proposed projects, a temporary construction zone would be created and would not result in any significant effect. No other impacts to public facilities are anticipated. Finished shoreline and coastal bluff protection devices and sand replenishment and retention devices would not create any parking problems, would not result in increases in traffic or levels of service, nor conflict with any plans for transportation alternatives.

Section 3 discusses results of the environmental analysis for geology and soils, land use, biological resources, recreation and public access, population and housing, aesthetics, and utilities and service systems. Impacts of Alternatives 1 and 2, associated with land use, biological resources, population and housing, and utilities and service systems were found to be below a level of significance. Alternative 3 was found to have impacts below a level of significance to all of the resource areas with the exception of some sand retention structures having potential impacts on biological resources. Alternative 4 was found to have less than significant impacts to geology and soils, biology, recreation, aesthetics, and utilities and service systems.

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9.0 PUBLIC AND AGENCY INVOLVEMENT

9.1 Public Involvement

The issue of how to properly manage our shorelines is controversial due to conflicting opinions and approaches for successful solutions throughout the San Diego region. Community members of Solana Beach are actively involved in this issue as many coastal homeowners want to protect their shoreline fronting property, and others want to make preservation of the natural state of the beach the highest priority in management strategies. The most frequently used approach by homeowners and the City of Solana Beach to manage shoreline erosion processes specifically is through development of protective structures along the beach and seacliffs, such as seawalls and revetments, as allowed under the existing Shoreline and Coastal Bluff Protection Ordinance. Coalitions and organizations have been formed on both sides of the matter, to either support existing shoreline management policies in the City, or to offer alternative solutions to allowing permits for protective structures.

9.2 Scoping Process

The City of Solana Beach held a scoping meeting on April 10, 2001 with community members and interest groups to address essential issues and define the scope of the MEIR. The City distributed a Notice of Preparation (NOP) to federal, state, county, and city agencies as well as other agencies and organizations. The purpose of this meeting and notification was to answer questions, receive oral and written comments from the public, and identify public and agency concerns pertaining to potential impacts of the existing Shoreline and Coastal Bluff Protection Ordinance and proposed policies and programs. Comments stated at the scoping meeting and written comments received during the 30-day review period for the NOP are included in Appendix C.1. The proposed alternatives considered in the MEIR were based upon public input and existing data relevant to issues concerning the existing Shoreline and Coastal Bluff Protection Ordinance.

A matrix was created, following the scoping meeting and review of written and oral comments, to identify and maintain a comprehensive list of issues of concerns identified by all interested parties throughout the scoping process. This matrix was utilized to help identify appropriate resource sections and alternatives for the MEIR (see Appendix C.2).

9.3 Agency Involvement

The City is the Lead Agency with the jurisdiction to certify the Final MEIR. Other interested agencies include the California State Lands Commission and the California Coastal Commission.

9.4 Summary of Potential Environmental Issues Identified

The potential environmental issues identified throughout the scoping process included concerns related with potential impacts of the Shoreline and Coastal Bluff Protection Ordinance, more specifically shoreline structures permitted under the Ordinance. Other potential future shoreline strategies were identified on biological resources, geology and soils, aesthetics, public access and recreation, utilities and service systems, economics, public safety, and sand replenishment. The California Coastal Commission's comments on the City's Draft LCP were also taken into consideration to address all relevant issues applicable to shoreline management, protective structures, and potentially impacted resource areas. Other concerns of community members in particular were solely based on property rights issues.

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