

## **5.4 GEOLOGY, SOILS, LAND CAPABILITY, AND COVERAGE**

This section discusses the regulatory guidance for earth resources and evaluates potential adverse environmental effects related to geology, soils, seismic conditions, and land capability and coverage associated with implementation of the proposed Beach Club project alternatives, A through E. This section describes existing conditions, geologic setting, relevant soil properties as they relate to geotechnical issues, and associated elements of land capability and coverage. Environmental effects to these resources are assessed using planning guidelines and regulations established by TRPA. Potential environmental effects related to water quality resulting from soil erosion and other stormwater issues are addressed in Section 5.5, “Hydrology and Water Quality.” Cumulative impacts are presented in Section 5.14.

The examination of geology, soils, seismic hazards, and land capability and coverage is based on information from: (1) site observations; (2) review of academic research and available information published by local, state and federal agencies; (3) the Soils Report (R. J. Poff & Associates 2003); (4) the Soils/Hydrologic Final Report (Kleinfelder 2003); and (5) the Preliminary Geotechnical Investigation (Harding ESE 2002). These documents are included in Appendix B of this EIS.

### **5.4.1 REGULATORY BACKGROUND**

#### **TAHOE REGIONAL PLANNING AGENCY LAND COVERAGE REGULATIONS**

Soil conservation is essential for the maintenance of healthy plant communities, prevention of erosion, protection of water quality, maintenance of healthy stream systems, and protection of lake clarity. Soil conservation in the Lake Tahoe Basin is addressed in the context of two key concepts: impervious land coverage and SEZ. Impervious land coverage, such as asphalt, concrete, and roofs, prevents stormwater runoff from absorbing into the ground. When runoff bypasses natural processes of infiltration and migration through soil, it is not filtered by the soil and does not contribute to local groundwater supplies. Excess runoff overloads stream channels, erodes stream banks and unnecessarily damages vegetation. Stream channel erosion transports nutrients and sediments to Lake Tahoe and contributes to the degradation of water clarity. SEZs are meadows, marshes, and wetlands that slow runoff by dispersing it over a large area, allowing sediment to settle out and vegetation to take up nutrients.

#### **LAND CAPABILITY DISTRICTS**

Since February 10, 1972, regulatory agencies in the Lake Tahoe Basin, primarily TRPA, have used the land capability classification system known as the “Bailey System” (Land-Capability Classification of the Lake Tahoe Basin, California-Nevada: A Guide to Planning [Bailey 1974]) to evaluate applications that request either additional land coverage to existing developed lots or building permits for new development. The Bailey System was developed as an erosion control technique to mitigate the deleterious effects to stream systems and water quality that result from excessive land coverage. The Bailey System restricts the amount of impervious land coverage on all parcels and generally prohibits new land coverage in areas classified as SEZ.

Land capability is defined as “the level of use an area can tolerate without sustaining permanent (environmental) damage through erosion and other causes” (Bailey 1974). The Bailey system uses land capability districts (LCD) ranging from 1 to 7, which assign a percentage of land coverage allowable in the designated LCD area (Table 5.4-1). Land coverage includes impervious surfaces such as roadways, sidewalks, and structures that prevent precipitation from directly reaching the soil surface.

<b>Table 5.4-1 Capability Districts for Lake Tahoe Basin Lands</b>					
Capability Levels	Tolerance for Use	Slope Percent	Relative Erosion Control	Runoff Potential	Disturbance Hazards
7	Most	0–5	Slight	Low to moderately low	Low-hazard lands
6		0–16		Low to moderately low	
5		0–16	Moderately high to high		
4		9–30	Moderate	Low to moderately low	Moderate-hazard lands
3		9–30	Moderate	Moderately high to high	
2		30–50	High	Low to moderately low	
1a		Least	High	Moderately high to high	
1b	(Poor Natural Drainage)				
1c	(Fragile Flora and Fauna)				

Source: TRPA 2000

LCDs were derived by analyzing the frequency and magnitude of hazards that may be encountered and by considering the type and intensity of uses suitable for each unit (TRPA 2000). The integration of the LCD and land use suitability resulted in limits on land-surface modifications for each LCD that are expressed as a percentage of each area that can be used for impervious coverage.

Chapter 2 of the TRPA Code of Ordinances defines land coverage as a man-made structure, improvement, or covering that prevents normal precipitation from directly reaching the surface of the land underlying the structure, improvement, or covering. Examples include roofs, decks, patios, and surfaces paved with asphalt, concrete, or stone. Such structures are defined as “hard coverage.” Compacted areas without structures are defined as “soft coverage.” A structure, improvement, or covering shall not be considered land coverage if it permits at least 75% of normal precipitation to directly reach the ground and permits growth of vegetation described on TRPA’s approved species list (TRPA 1991). TRPA Code of Ordinances Chapter 20, Land Coverage Standards identify the allowable land coverage (in terms of percent) by LCD (Table 5.4-2).

<b>Table 5.4-2 Tahoe Regional Planning Agency Base Land Coverage Requirements</b>	
Land Capability District	Base Coverage
6, 7	30%
5	25%
4	20%
3	5%
2	1%
1a, 1b, 1c	1%

Source: TRPA 1991

## FEDERAL EARTHQUAKE HAZARDS REDUCTION ACT

The U.S. Congress passed the Earthquake Hazards Reduction Act in 1997 to “reduce the risks to life and property from future earthquakes in the United States” through the establishment and maintenance of an effective

earthquake hazards and reduction program. To accomplish this, the Act established the National Earthquake Hazards Reduction Program (NEHRP). This program was significantly amended in November 1990 by the National Earthquake Hazards Reduction Program Act (NEHRPA) by refining the description of the agency responsibilities, program goals, and objectives.

NEHRP's mission includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improved building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improved mitigation capacity; and accelerated application of research results. The NEHRPA designates the Federal Emergency Management Agency (FEMA) as the lead agency of the program and assigns it several planning, coordinating, and reporting responsibilities. Other NEHRPA agencies include the National Institute of Standards and Technology (NIST), the National Science Foundation (NSF), and the U.S. Geological Survey (USGS).

## **BUILDING CODES**

The International Code Council (ICC) is responsible for developing building codes that must be complied with when constructing residential or commercial buildings throughout the United States. Building codes developed by the ICC include the International Building Code (IBC), the Uniform Building Code (UBC), and International Residential Code (IRC), among others. Douglas County adheres to 2003 IRC for seismic regulations of residential developments.

## **DOUGLAS COUNTY**

For projects within the Lake Tahoe Basin, Douglas County defers to TRPA regulations where the TRPA Code of Ordinances are more stringent. However, Douglas County requires development applications; reviews project plans and specifications; and issues various permits including grading and structural building permits.

The *Draft 2006 Douglas County Master Plan* contains the following goals and policies relevant to geology, soils, and seismicity in the project area.

- ▶ **GOAL 5.01:** To minimize danger and damage to County residents from natural hazards due to seismic activity, liquefaction, and other geologic hazards.
- ▶ **Policy 5.01.03:** Require site specific soils and geologic studies to assess natural and graded slope stability for development proposed in areas which may have moderate to high potential for landsliding, erosion, or other soil or geologic instability and require mitigation through setbacks, special foundation design, etc.
- ▶ **Policy 5.01.04:** Restrict location of utility lines within an appropriate distance from active fault traces. Utility lines crossing active fault traces should be specifically designed to withstand the expected movement. Utility lines would include electricity, water, gas, and sewer.
- ▶ **Policy 5.02.03:** Douglas County shall consider the use of clustering and other flexible design techniques for development of land in areas of moderate to steep slopes, in order to minimize the environmental, seismic, aesthetic, and service impacts of the development.
- ▶ **Policy 5.02.06:** Erosion control and slope stability measures shall be included within development guidelines and shall consider such things as lifecycle maintenance costs.

## 5.4.2 AFFECTED ENVIRONMENT

### GEOLOGY

The Lake Tahoe Basin is located in the northern Sierra Nevada, between the Sierra crest to the west and the Carson Range to the east. The Sierra Nevada is the most prominent mountain range in California, and in conjunction with the Central Basin, forms part of the Sierra Nevada microplate, an element of the broad Pacific–North American plate boundary (Argus and Gordon 1991). The motion of the Sierra Nevada microplate relative to the stable North American plate is approximately parallel to the strike of the San Andreas Fault system in central and northern California, oriented from N35W to N40W. Before becoming part of the transform plate margin, the Sierra Nevada was the site of a Cenozoic volcanic arc, with related deposits draping over pre-Cenozoic metamorphic and plutonic rocks (Wakabayashi and Sawyer 2000). The general asymmetry of the Sierra Nevada reflects uplift and gentle westward tilting.

The Lake Tahoe Basin was formed over 2 million years ago by a combination of faulting and volcanism. As a result, the basin contains a combination of granitic, metamorphic, and volcanic rock. The predominant bedrock in the basin is Cretaceous granodiorite of the Sierra Nevada batholith. Cretaceous rock is from the third and last period of the Mesozoic Era, characterized by the development of flowering plants and ending with the sudden extinction of the dinosaurs and many other forms of life. Pre-Cretaceous metamorphic rocks are found in localized areas, and volcanic andesitic mudflows and lava extend from the top of Martis Peak to the northern lakeshore (Kleinfelder 2001).

Over the past 1.5 million years, the Lake Tahoe region has been altered by glacial activity, and most of the landforms surrounding the lake are a result of glaciation. During glacial activities, valley glaciers dammed the Truckee River canyon, raising the water level of Lake Tahoe. Lacustrine sediment deposits resulted in the bays and canyons around the lake that resulted from the rising of lake levels (Kleinfelder 2001). Rocks found near the surface in the Lake Tahoe basin are of many types and ages because of the complex geologic history of the area. The faulting, folding, and in some cases overturning of rock formations that has taken place during various periods of geologic activity, in combination with erosion, deposition, and subsequent cementation of rock materials that occurred during relatively quiet periods, have left a complex arrangement of geologic rock types and structures in the area. However, the extraordinary clarity of Lake Tahoe is mostly related to the prevalence of highly fractured bedrock, moderate to highly permeable soils, and gentle slopes immediately surrounding Lake Tahoe.

The Geologic Map of the Lake Tahoe Basin, California and Nevada (California Department of Conservation California Geological Survey 2005) indicates that the project site is located on three geologic formations. A portion of the site is located on Holocene (10,000 years ago to present) deposits, which include beach deposits (Qb) of moderately sorted fine- to very coarse-grained to gravelly arkosic sand located along the project site's shoreline and flood-plain deposits (Qfp) of gravelly to silty sand and sandy to clayey silt located inland of the beach. The more easterly portion of the project site is located on Pleistocene era (1.8 million to 10,000 years ago) lacustrine terrace deposits (Qlt), which are poorly to moderately sorted silt, sand and gravel forming low terraces 5–10 meters above lake level. There are no known significant mineral resources associated with the project site.

### Topography

The project site is located along the south shore of Lake Tahoe in Stateline, Nevada. The project site includes an upland area and a small beach area. Topography of the site is gently sloping to the east, rising approximately 22 feet above lake level at its highest point, ½ mile from the edge of Lake Tahoe. Drainage of the project site is in a general northwest direction, eventually flowing into the drainage ditch at the northern boundary of the site.

## **Faults**

A fault is defined as a fracture or zone of closely associated fractures along which rocks on one side have been displaced with respect to those on the other side. Most faults are the result of repeated displacement that may have taken place suddenly and/or by slow creep.

The North Tahoe Fault, located beneath the lake, is a northeast-trending fault, approximately 7.0 miles long. It is estimated to be capable of generating an earthquake of magnitude 7.0; however, it has been inactive for at least 10,000 years (Kleinfelder 2001 and Jennings 1992). The East Tahoe Fault borders the east side of Lake Tahoe Basin also crossing through Douglas County (Sawyer 1999).

Predicting when an earthquake will occur is difficult; however, predicting the response of the ground surface to seismic vibration can be much more plausible. Therefore, site geology is essential in predicting the results of future earthquakes. One measure of this is the likelihood of liquefaction to occur on a project site. Based on site investigations by Harding ESE, the potential exists for liquefaction to occur on the project site due to the presence of saturated granular soils (2002).

## **SOILS**

Soils are a critical element in land-use planning and environmental analyses in the Lake Tahoe region because the TRPA Land Capability Districts are determined based on soil types. The U.S. Department of Agriculture, Natural Resources Conservation Service (formerly the Soil Conservation Service) soil surveys show soils on the project site are primarily from the Elmira Series. There are also areas of Elmira Series, Wet Variant and Beaches within the project site.

A soils report prepared by R. J. Poff & Associates (2003) identified the following three soils classes on the project site: (1) well-drained upland soils (equivalent to Elmira), (2) an upland-meadow transition (between Elmira and Elmira, Wet Variant), and (3) wet meadow soils (equivalent to Elmira, Wet Variant). The upland meadow soil in the project area is characterized by a dark-colored, humic A horizon, typically 12-18 inches thick. The underlying subsoil is mostly gleyed and composed of mixed alluvium that may have seasonal high water in places.

According to the 1974 Soil Conservation Service soil survey, the Elmira Series consists of nearly level to moderately steep, somewhat excessively drained soils that are underlain by sandy granitic alluvium or highly weathered till. These soils are on glacial outwash fans and moraines. The parent material is mixed, but is predominantly granitic alluvium. Slopes are 0 to 30%, and elevations are between 6,200 to 6,500 feet.

The 1974 soil survey also describes the Elmira Series, Wet Variant consists of nearly level to gently sloping, poorly drained soils that are underlain by stratified alluvium. These soils are in drainageways of glacial outwash fans. The parent material is mixed, but is predominantly granitic alluvium. Slopes are 0 to 5%, and elevations are between 6,200 and 6,500 feet.

The Beaches classification is a miscellaneous map unit that is adjacent to the lake shore, mainly the south shore. It is coarse sand derived from granitic alluvium.

## **Subsurface Conditions**

A total of 13 test pits were excavated on the site as part of soils studies prepared for the project. Nine test pits were excavated by R. J. Poff & Associates in May 2003 and four additional test pits were excavated by Kleinfelder in June 2003.

The upland meadow soils on the project site typically had 12 to 18 inches of a humic A over a gleyed C of very coarse sand. Some areas, that appear to be old buried stream channels, have a silty clay C horizon. Some redoximorphic features were observed on the site at various depths. Redoximorphic features are color patterns in the

soil formed by the oxidation and reduction of iron and/or manganese caused by saturated conditions within the soil. Because of the extensive modification of soils on the site, and because of the current and possibly historic water-line leak, the redoximorphic indicators of aquic conditions that were observed may not be reliable indicators of past or current conditions. Some of the redoximorphic features observed may be relic, (i.e., developed before the site was graded) when the soil was in a different position relative to the water table. Other redoximorphic features could be recent; the consequence of water-line leaks. A number of iron masses were also encountered ranging in depth from 14 to 55 inches (R. J. Poff & Associates 2003). Further study of the shallow water table during the early part of the growing season would be necessary to determine if the redoximorphic features are active or relict. Until such study is done, those soils having redoximorphic features in the upper 20 inches would be considered to meet the soil requirements for an SEZ.

The exact locations of the borings and additional descriptive information on subsurface conditions at the project site are presented in the “Soils Report, Tahoe Beach Club,” (May 2003) and the “Soils/Hydrologic Final Report,” (June 2003) included as Appendix B of this EIS.

## LAND CAPABILITY

The proposed project site is located in LCDs 1b and 7. LCD 1b has a base allowable coverage of 1% and LCD 7 has a base allowable coverage of 30% (TRPA Code of Ordinances 20.3.A). If the project site were undeveloped, these land capability districts would establish the allowable coverage for the site. However, the project site is developed and currently occupied by the Tahoe Shores Mobile Home Park. The developed land coverage on the project site is recognized by TRPA and provides the basis for allowing excess coverage to remain.

Table 5.4-3 lists the LCDs associated with the project site, the area (in acres and square feet) of each LCD, the allowable percentage of coverage for an undeveloped site, and the allowable percentage coverage that has been recognized by TRPA for the project site. Mitigation of the excess land coverage would occur as specified by Chapter 20 of the TRPA Code of Ordinances.

Project Site LCD	Area of Project Site (acres / sf)	% Base Allowable Coverage	Allowable Coverage for Undeveloped Site (acres / sf)	Allowable Coverage Recognized by TRPA (acres / sf)
1b	16.20 ac / 705,345 sf	1	0.16 ac / 7,053 sf	8.71 ac / 379,475 sf
7	3.44 ac / 149,656 sf	30	1.03 ac / 44,897 sf	1.80 ac / 78,484 sf
<b>Total</b>	<b>19.63 ac / 855,001 sf</b>		<b>1.19 ac / 51,950 sf</b>	<b>10.51 ac / 457,959 sf</b>

sf = square feet    LCDs = land capability districts  
Source: Design Workshop 2004, Nichols Consulting Engineers 2004

A Request for Verification of Land Capability was filed with TRPA to verify the LCDs associated with APNs 1318-22-002-002 (old APN 07-090-05) and 1318-22-002-001 (old APN 07-090-06). The land capability was mapped in terms of soil map unit and the LCD 1b and LCD 7 districts described in Table 5.4-3 were verified as accurate and true on April 3, 2004 (Exhibit 3-11) (Appendix B).

The majority of the project site is designated LCD 1b. This area is approximately 82.5% of the project site and would have allowable land coverage of 1%, or 7,053 sf (0.16 acre) if it were an undeveloped site. However, based on the existing coverage recognized by the TRPA Verification (April 3, 2004), the approved LCD 1b land coverage for the project site is 379,475 sf (8.73 acres). The remainder of the site is designated LCD 7. The area designated LCD 7 occupies approximately 17.5% of the site. Allowable land coverage for LCD 7 would be 30%,

or 44,897 sf (1.03 acres) if it were an undeveloped site. Again, based on the TRPA Verification (April 3, 2004) the approved LCD 7 land coverage for the project site is 78,484 sf (1.80 acres).

### 5.4.3 ENVIRONMENTAL CONSEQUENCES AND RECOMMENDED MITIGATION MEASURES

#### CRITERIA OF SIGNIFICANCE

The TRPA Land Classification System (Tables 5.4-1 through 5.4-3) is used to analyze potential impacts to sensitive slope, soils, and drainage conditions. The TRPA Code of Ordinances does not contain other additional policies or thresholds related to land coverage or geologic hazards.

Based on TRPA's Initial Environmental Checklist, the proposed project would result in a significant impact to geology and soils if it would:

- ▶ compact or cover soil with impervious surfaces beyond the limits allowed in the land capability districts;
- ▶ expose people or property to seismic hazards such as earthquakes, landslides, backshore erosion, avalanches, mud slides, ground failure, or similar hazards;
- ▶ be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse; or
- ▶ cause a change in deposition or erosion of beach sand, or change in siltation, deposition or erosion, including natural littoral processes, which may modify the channel of a river or stream or the bed of a lake.

Significance criteria used in the analysis of land coverage relate directly to the TRPA Land Classification system and coverage requirements. Seismic hazards may include earthquake, liquefaction, subsidence, tsunami, and seiche potential. Non-seismic geologic hazards are discussed with regard to potential impacts on the alteration of the land surface (naturally or through human actions), including grading, deposition or erosion, landslides, avalanche, or any effects that are because of or that may alter soil properties or geotechnical issues. Although landslide, mudslides, avalanche, and other geomorphological events can be triggered by seismic activity, it is not necessarily a prerequisite. Therefore, they are addressed under non-seismic geologic hazards unless site-specific conditions warrant otherwise.

#### ALTERNATIVE A—PROPOSED PROJECT

**IMPACT**     **Land Coverage.** *Alternative A would result in a total of approximately 358,907 sf (8.24 acres) of coverage, a reduction in site coverage of approximately 99,052 sf (2.27 acres) or 22% from the TRPA-verified coverage (457,959 sf or 10.51 acres); the majority of the coverage reduction would be within primary SEZ (LCD 1b) areas. Alternative A would also result in the relocation of some existing coverage and the restoration of approximately 2 acres of SEZ habitat. On the whole, the coverage reduction, the relocation of coverage, and the proposed restoration associated with Alternative A would provide a net environmental benefit. For this reason this would be a **beneficial** impact.*

Approximately 149,656 sf (3.44 acres) of the project site is currently designated as LCD 7, which has a base allowable coverage of 30% (44,897 sf or 1.03 acres). However, because the site is developed, the TRPA-verified site coverage in LCD 7 of 78,484 sf (1.80 acres) provides the basis of the allowed coverage for this portion of the project site. Alternative A would reduce coverage in LCD 7 to approximately 68,359 sf (1.57 acres). Although this is approximately 23,462 sf (0.54 acre) over that which would be allowed on an undeveloped site, the coverage proposed under Alternative A would be a reduction of approximately 10,125 sf (0.23 acre) in LCD 7 compared to existing conditions.

Approximately 705,345 sf (16.19 acres) of the project site is designated as LCD 1b, which has a base allowable coverage of 1% (7,053 sf or 0.16 acre). However, as explained above for LCD 7, the TRPA-verified coverage in LCD 1b of 381,637 sf (8.76 acres) provides the basis of the allowed coverage for this portion of the project site. Alternative A would reduce the coverage in LCD 1b to approximately 290,548 sf (6.67 acres). Although this is approximately 283,495 sf (6.51 acres) over that which would be allowed on an undeveloped site, the coverage proposed under Alternative A would be a reduction of approximately 91,089 sf (2.09 acres) compared to existing conditions.

The applicant would be required to either remove coverage in excess of the LCD base allowable, or submit an excess coverage mitigation fee. Beach Club, Inc. would submit an excess coverage mitigation fee to retain the excess coverage in LCD 1b and LCD 7, as determined by TRPA Code of Ordinances Section 20.5.A(3). The mitigation fee shall be based on the area of excess coverage, approximately 306,957 sf (7.05 acres) for the entire project site under Alternative A, in accordance with subparagraph 20.5.A(3)(a) of the TRPA Code of Ordinances. The excess coverage square footage is then multiplied by the appropriate Mitigation Fee Coverage Cost Factor to determine the excess coverage mitigation fee. The mitigation fee coverage cost factor is established by TRPA staff before January 1 of each year, based on a certified real estate appraiser's estimate of the land bank's cost to acquire land coverage under the TRPA Excess Land Coverage Mitigation Fee program. Before project implementation, the proposed mitigation for excess land coverage shall be formalized through a written agreement between TRPA and Beach Club, Inc.

In addition to reducing coverage on the project site, Alternative A would cause a portion of the existing coverage to be relocated. TRPA Code of Ordinances Section 20.5.C describes the conditions under which existing land coverage may be relocated on the same parcel or project area. As discussed above, Alternative A would reduce the amount of coverage in the two LCDs on the site (LCD 1b and 7). A comparison of Exhibit 3-3 and 3-11 in Chapter 3, "Project Description," shows that proposed development would largely occur within areas that have already been developed and disturbed. The footprint of the proposed swim and beach club building and the western terminus of the project roadway would occur in an area with limited existing development, but likely the site of previous disturbance. As required by TRPA Code of Ordinances Section 20.5.C(2), any area from which land coverage was removed for relocation must be restored. It is expected that with the reduction and relocation of coverage combined with the proposed 2 acres of SEZ restoration that there would be a net environmental benefit to the function of the SEZ. Consistent with TRPA Code of Ordinances Section 20.5.C(4)(c), a SEZ Coverage Relocation Report was prepared for the project (Nichols Consulting Engineers & Telesto Nevada 2007). The report breaks down the 22% reduction in site coverage by LCD that would occur with implementation of Alternative A as follows:

- ▶ 16% reduction within Primary SEZ areas (LCD 1b)
- ▶ 4% reduction within Secondary SEZ areas (LCD 1b)
- ▶ 2% reduction within LCD 7

About 48% of the Primary SEZ (LCD 1b) coverage reduction would be from a sensitive area directly adjacent to Burke Creek Meadow, an area that currently consists of mobile home units and paved areas with a cut-off drainage ditch that intercepts high flows. This area would be restored to a natural SEZ condition to enhance the functionality of the floodplain and reestablish the historical habitat. The restoration area consists of the removal of the cut-off ditch and the non-native fill material, along with replacement of soils and vegetation that is consistent with the adjacent Burke Creek Meadow. The restoration would aid in the functioning of the SEZ within the project area and enhance the quality of the habitats within the meadow. About 13% of the Primary SEZ (LCD 1b) reduction would be relocated to a less sensitive area near the KGID water supply pump station, and the remainder would be banked. On the whole, the proposed coverage reduction associated with the project, the relocated coverage and restoration would provide a net environmental benefit. For this reason, this would be a **beneficial** impact.

## Mitigation Measures

No mitigation is required.

**IMPACT 5.4.A-2** **Seismic Hazards.** *The project site is located near several faults in South Lake Tahoe and Douglas County that could subject the site to ground shaking. Because the project would be designed and constructed in accordance with the current design requirements of UBC Seismic Zone 3, there would be no substantial increased risk of injury or property damage from strong ground shaking or earthquake-induced liquefaction or landslides caused by unstable soils. This is considered a **less-than-significant** impact.*

There are several active faults in the project vicinity including the North Tahoe fault, the East Tahoe fault, and the Genoa fault. According to the Earthquake Potential Map for Portions of Eastern California and Western Nevada (California Geological Survey [CGS] 2005), the South Tahoe area is considered to have a moderate potential for shaking from seismic-related activity. The project facilities would be designed and constructed in accordance with the current design requirements for UBC Seismic Zone 3 and International Residential Code (IRC). Therefore, there would be no substantial increased risk of injury or property damage from strong ground shaking. Should additional information become available indicating an increased risk of seismic activity near the project site, a seismic risk analysis by a professional geologist should be performed before construction.

Other potential seismic hazards include tsunami or seiche. A tsunami is a series of waves that may result from a major seismic event that involves the displacement of a large volume of water and can occur in any large body of water. A seiche is a periodic oscillation of an enclosed or restricted water body, typically a lake or reservoir, produced by seismic shaking. A seiche results in a potentially damaging wave, similar to a tsunami, which may result from seismic activity near a large lake. A seiche (wave) may occur in periods that differ from a tsunami. But should the period of wave propagation occur simultaneously with a tsunami, it could result in cumulative seismic-related wave effects. Ichinose et al. (1999) show through simulations that model wave propagation for various earthquake scenarios that if a large earthquake (~M7) were to occur, there exists the potential for both tsunami and seiche-related waves to impact lakeside communities on the California and Nevada sides of Lake Tahoe.

To date, modeling has not been conducted to determine a minimum level of high ground or safety in the event of a seiche or tsunami. The average surface elevation of Lake Tahoe is 6,225 feet above mean sea level (USGS 2005b), and the project site extends to lake level. The probability of an earthquake strong enough to cause a seiche in Lake Tahoe is relatively low: only 3–4% in 50 years (Ichinose, et. al. 1999), so effects from a tsunami or seiche are not considered likely to occur.

Although the potential for seismic hazards exist in the project area and throughout the Tahoe Basin in general, the local earthquake-induced shaking potential is not considered high (CGS 2005), and current building codes substantially reduce the potential for damage and loss of life by preventing building collapse. Therefore, impacts related to seismic hazards at the project site for Alternative A are considered **less than significant**.

## Mitigation Measure

No mitigation is required.

**IMPACT 5.4.A-3** **Non-Seismic Geologic Hazards.** *The project site is relatively level and is not subject to landslides or mudslides. However, the soils/hydrologic subsurface investigation found loose to medium dense, moist to wet, granular soils in the upper 6 feet of the project site which may exhibit excessive settlement if spread footings are founded within them. This is a **potentially significant** impact.*

Alternative A and its associated infrastructure would be constructed on a gently sloping project site, which is not subject to landslides or mudslides. Approximately 21,000 cubic yards (CY) of cut would be required for

Alternative A, and approximately 24,000 CY of fill would be required. The cut and fill would be generally balanced; however, a small volume of imported soil may be needed. This is an estimate based on the preliminary grading plan and does not take into consideration several factors, including the shrink/swell potential of the soil or the potential use of the net cut as fill that would be needed for roadwork on site, such as asphalt paving or aggregate base.

Investigations for the Preliminary Geotechnical Investigation Monitoring Well/Piezometer Installation Tahoe Shores Development (Preliminary Geotechnical Investigation) determined that loose to medium dense, moist to wet, granular soils in the upper 6 feet of soil on the project site may exhibit excessive settlement if spread footings are founded directly on them (Harding ESE 2002). Excessive settlement of foundations could cause significant safety hazards. Therefore, Alternative A would have **potentially significant** impacts related to non-seismic geologic hazards.

**Mitigation Measure 5.4.A-3a. Submit Final Geotechnical Engineering Report and Improvement Plans to TRPA and Douglas County.** The project applicant shall implement the following:

- ▶ Submit to TRPA for review and approval a geotechnical engineering report produced by a qualified professional civil engineer or geotechnical engineer. The report shall address and make recommendations on the following: (1) road, pavement, and parking area design; (2) structural foundations and spread footings in response to the potential for liquefaction; (3) grading practices; (4) erosion/winterization; (5) special problems discovered on-site (i.e., groundwater, expansive/unstable soils; and (6) slope stability. Once approved by TRPA, two copies of the final report shall be provided to TRPA and one copy to the Douglas County Building Department for their use. If the soils report indicates the presence of critically expansive or other soils problems which, if not corrected, could lead to structural defects, a certification of completion of the requirements of the soils report may be required before issuance of building permits. It is the responsibility of the developer to provide for engineering inspection and certification that earthwork has been performed in conformity with recommendations contained in the report.
- ▶ The applicant shall prepare and submit Improvement Plans, specifications, and cost estimates to TRPA and Douglas County for review and approval of project construction. The plans shall show all conditions for the project, as well as pertinent topographical features both on- and off-site. All existing and proposed utilities and easements, on-site and adjacent to the project, which may be affected by planned construction shall be shown on the plans. All landscaping and irrigation facilities in the public right-of-way or public easement, or landscaping within sight distance areas at intersections, shall be included in the Improvement Plans. The applicant shall pay plan check and inspection fees and before plan approval, all applicable recording and production costs shall be paid. The cost of the above-noted landscape and irrigation facilities shall be included in the estimates used to determine these fees. It is the applicant's responsibility to obtain all required agency signatures on the plans and to secure TRPA and County approvals. If the Design/Site Review and/or Design Review Committee (DRC) review is required as a condition of approval for the project, said review process shall be completed before submittal of Improvement Plans. Record drawings shall be prepared and signed by a Nevada Registered Civil Engineer at the applicant's expense and shall be submitted to TRPA and Douglas County before acceptance of site improvements.
- ▶ All proposed grading, drainage, and utility improvements, and vegetation and tree removal shall be shown on the improvement plans, and all work shall conform to provisions of the Douglas County Grading Ordinance that are in effect at the time of the submittal. No grading, clearing, or tree disturbance shall take place until the improvement plans are approved and all temporary construction fencing has been installed and inspected by a member of the Design Review Committee. All cut/fill slopes shall be at 2:1 (horizontal:vertical) unless a soils report supports a steeper slope and TRPA concurs with said recommendation. The applicant shall revegetate all disturbed areas. Revegetation undertaken from April 1 to October 1 shall include regular watering to ensure adequate growth. A winterization plan shall be provided with project improvement plans. It is the applicant's responsibility to ensure proper installation and maintenance of erosion control winterization

during project construction. Where soil stockpiling or borrow areas are to remain for more than one construction season, proper erosion control measures shall be applied as specified in the improvement plans/grading plans. Provide for erosion control where roadside drainage is off the pavement to the satisfaction of TRPA. The applicant shall also submit to TRPA an adequate security in accordance with TRPA Attachment J before improvement plan approval to guarantee protection against erosion and improper grading practices. On TRPA's acceptance of improvements and satisfactory completion of a 1-year maintenance period, unused portions of the security deposit shall be refunded to the project applicant or authorized agent.

- ▶ If at any time during construction a field review by TRPA personnel indicates a significant deviation from the proposed grading shown on the improvement plans, specifically with regard to slope heights, slope ratios, erosion control, winterization, tree disturbance, and/or pad elevations and configurations, the plans shall be reviewed by the Design Review Committee/TRPA for a determination of substantial conformance to the project approvals before any further work proceeds. Failure of the Design Review Committee/TRPA to make a determination of substantial conformance may serve as grounds for revocation/modification of the project approval by the appropriate hearing body.
- ▶ The applicant shall provide TRPA with a letter from the Tahoe Douglas Fire Protection District describing conditions under which the service would be provided to the project. Said letter shall be provided before the approval of Improvement Plans, and a fire district representative's signature shall be provided on the plans.

**Mitigation Measure 5.4.A-3b. Develop and Implement a Dewatering Plan Pursuant to Mitigation Measure 5.5.A-4.** The dewatering plan developed and implemented as part of Mitigation Measure 5.5.A-4 (see Section 5.5, "Hydrology and Water Quality") must detail procedures for safely and appropriately dealing with seasonal groundwater encountered during excavation.

**Mitigation Measure 5.4.A-3c. Obtain Grading Permit from TRPA and Douglas County and Ensure that All Earthwork is Monitored by a Geotechnical Engineer.** The project applicant shall ensure the following:

- ▶ Obtain a Grading Permit from TRPA and Douglas County before export or import of any soil or other material to or from an off-site location.
- ▶ The construction and/excavation contractor secures a source of transportation and a location for deposition and/or storage of all exaction materials removed from the project site.
- ▶ All earthwork is monitored by a geotechnical engineer tasked with the responsibility of providing oversight during all excavation activities, placement of fill, and disposal of materials removed from and deposited on the project site.

**Mitigation Measure 5.4.A-3d. Perform Project Specific Design Foundation Investigation.** Based on the Preliminary Geotechnical Investigation, it is recommended that a project specific design foundation investigation is performed on the project site to further evaluate the suitability of soils on the project site for placement of foundations. It is also recommended that the option of a mat or deep foundation (piers/piles) system is considered to mitigate potential excessive settlement and liquefaction concerns.

Implementation of Mitigation Measures 5.4.A-3a through d would reduce the potential non-seismic geologic hazard impacts of Alternative A to a **less-than-significant** level.

**IMPACT 5.4.A-4** **Interception of Groundwater Table During Construction.** *Excavation during construction of Alternative A could intercept the groundwater table, creating the potential for introduction of contaminants to groundwater. Excavation activities for the foundations of the proposed buildings would be approximately 3 to 5 feet. The deepest excavations could reach a maximum depth of approximately 5 to 8 feet below ground surface and groundwater has been encountered within the upper 6 feet of soils on the project site. This is a **potentially significant** impact.*

For a detailed discussion of this impact refer to Impact 5.5.A-4 in Section 5.5, “Hydrology and Water Quality.”

**Mitigation Measure 5.4.A-4.** Develop and Implement a Dewatering Plan Pursuant to Mitigation Measure 5.5.A-4. See Mitigation Measure 5.5.A-4 described in Section 5.5, “Hydrology and Water Quality.” The same mitigation would apply.

Implementation of Mitigation Measure 5.5.A-4 would reduce Impact 5.4.A-4 to a **less-than-significant** level.

**IMPACT 5.4.A-5** **Littoral Zone Sedimentation.** *The proposed reconstruction and expansion of the existing pier and the relocation of the three existing buoys would be designed and constructed consistent with the provisions of TRPA Code of Ordinances Section 54.4.B Design and Construction Standards relevant to littoral processes. The expanded pier and relocated buoys would not substantially interfere with littoral processes. The littoral processes with the proposed project are expected to be the same as existing conditions. Therefore, this impact is considered **less than significant**.*

For a detailed discussion of this impact refer to Impacts 5.5.A-5 and 5.5.A-6 in Section 5.5, “Hydrology and Water Quality.”

**Mitigation Measure**

None mitigation is required.

## **ALTERNATIVE B—TWO-LOT ALTERNATIVE, SINGLE-FAMILY ESTATES**

**IMPACT 5.4.B-1** **Land Coverage.** *Because Alternative B would result in substantial coverage reductions similar to Alternative A, this impact is similar to Impact 5.4.A-1 described above. Alternative B would result in a total of approximately 320,000 sf (7.35 acres) of coverage, a total reduction in site coverage of approximately 137,959 sf (3.17 acres) or 30.1% from the TRPA-verified coverage (457,959 sf or 10.51 acres). Alternative B would also result in the relocation of some existing coverage, but would not include the proposed SEZ restoration included as part of Alternative A. On the whole, it is expected that the coverage reduction and the relocation of coverage associated with Alternative B would provide a net environmental benefit. For this reason this would be a **beneficial** impact.*

Approximately 149,656 sf (3.44 acres) of the project site is currently designated as LCD 7, which has a base allowable coverage of 30% (44,897 sf or 1.03 acres). However, because the site is developed, the TRPA-verified site coverage in LCD 7 of 78,484 sf (1.80 acres) provides the basis of the allowed coverage for the project site. Alternative B would reduce coverage in LCD 7 to approximately 56,000 sf (1.29 acres). Although this is approximately 11,103 sf (0.25 acre) over that which would be allowed on an undeveloped site, the coverage proposed under Alternative B would be a reduction of approximately 22,484 sf (0.52 acre) compared to existing conditions.

Approximately 705,345 sf (16.19 acres) of the project site is designated as LCD 1b, which has a base allowable coverage of 1% (7,053 sf or 0.16 acre). However, as explained above for LCD 7, the TRPA-verified coverage in LCD 1b of 381,637 sf (8.76 acres) provides the basis of the allowed coverage for the project site. Alternative B

would result in approximately 264,000 sf (6.06 acres) of coverage in LCD 1b (based on a total of 320,000 sf of coverage on the project site and 82.5% of the site being located in LCD 1b). Although this coverage is approximately 256,947 sf (5.90 acres) over the base-allowable 1% coverage that would apply to an undeveloped site, Alternative B would result in a reduction in approximately 117,637 sf (2.70 acres) of coverage compared to the existing TRPA-verified site coverage in LCD 1b.

The applicant would be required to either remove coverage in excess of the LCD base allowable coverage or submit an excess coverage mitigation fee. Beach Club, Inc. would submit an excess coverage mitigation fee to retain the portion of coverage that exceeds the base allowable coverage in LCD 1b and LCD 7, as determined by TRPA Code of Ordinances Section 20.5.A(3). The excess coverage mitigation fee shall be calculated by determining the amount of excess coverage, approximately 258,050 sf (5.92 acres) for the entire project site under Alternative B, in accordance with subparagraph 20.5.A(3)(a) of the TRPA Code of Ordinances. The excess coverage square footage is then multiplied by the appropriate Mitigation Fee Coverage Cost Factor to determine the excess coverage mitigation fee. The mitigation fee coverage cost factor is established by TRPA staff before January 1 of each year, based on a certified real estate appraiser's estimate of the land bank's cost to acquire land coverage under the TRPA Excess Land Coverage Mitigation Fee program. Before project implementation, the proposed mitigation for excess land coverage shall be formalized through a written agreement between TRPA and Beach Club, Inc.

In addition to reducing coverage on the project site, Alternative B would cause a portion of the existing coverage to be relocated. It is expected that, as with Alternative A (see Impact 5.4.A-1 above), Alternative B would be designed or conditioned by TRPA such that with the reduction and relocation of coverage there would be a net environmental benefit to the function of the SEZ. For this reason, this would be a **beneficial** impact.

#### Mitigation Measures

No mitigation is required.

**IMPACT 5.4.B-2** **Seismic Hazards.** *Because Alternative B would be located on the same site as Alternative A, this impact is the same as Impact 5.4.A-2 described above. The project site is located near several faults in South Lake Tahoe and Douglas County that could subject the site to ground shaking. Because the Alternative B project components would be designed and constructed in accordance with the current design requirements of UBC Seismic Zone 3, there would be no substantial increased risk of injury or property damage from strong ground shaking or earthquake-induced liquefaction or landslides caused by unstable soils. This is considered a **less-than-significant** impact.*

#### Mitigation Measures

No mitigation is required.

**IMPACT 5.4.B-3** **Non-Seismic Geologic Hazards.** *Because Alternative B would be located on the same site as Alternative A, this impact is the same as Impact 5.4.A-3 described above. The project site is relatively level and is not subject to landslides or mudslides. However, the soils/hydrologic subsurface investigation found loose to medium dense, moist to wet granular soils in the upper 6 feet of the project site, which may exhibit excessive settlement if footings are founded within them. This is a **potentially significant** impact.*

**Mitigation Measure 5.4.B-3a. Submit Final Geotechnical Engineering Report and Improvement Plans to TRPA and Douglas County.** See Mitigation Measure 5.4.A-3a described above for Alternative A. The same mitigation would apply.

Mitigation Measure 5.4.B-3b. Develop and Implement a Dewatering Plan Pursuant to Mitigation Measure 5.5.A-4. See Mitigation Measure 5.4.A-3b above and Mitigation Measure 5.5.A-4 described in Section 5.5, “Hydrology and Water Quality.” The same mitigation would apply.

Mitigation Measure 5.4.B-3c. Obtain Grading Permit from TRPA and Douglas County and Ensure that All Earthwork is Monitored by a Geotechnical Engineer. See Mitigation Measure 5.4.A-3c described above for Alternative A. The same mitigation would apply.

Mitigation Measure 5.4.B-3d. Perform Project Specific Design Foundation Investigation. See Mitigation Measure 5.4.A-3d described above for Alternative A. The same mitigation would apply.

Implementation of Mitigation Measures 5.4.B-3a through d would reduce Impact 5.4.B-3 to a **less-than-significant** level.

**IMPACT 5.4.B-4** **Interception of Groundwater Table During Construction.** *Because Alternative B would be located on the same site as Alternative A, this impact is the same as Impact 5.4.A-4 described above. Excavation during construction of Alternative B could intercept the groundwater table, creating the potential for introduction of contaminants to groundwater. Excavation activities for the foundations of the proposed buildings would be approximately 3 to 5 feet. The deepest excavations could reach a maximum depth of approximately 5 to 8 feet below ground surface and groundwater has been encountered within the upper 6 feet of soils on the project site. This is a **potentially significant** impact.*

Mitigation Measure 5.4.B-4. Develop and Implement a Dewatering Plan Pursuant to Mitigation Measure 5.5.A-4. See Mitigation Measure 5.5.A-4 described in Section 5.5 “Hydrology and Water Quality.” The same mitigation would apply.

Implementation of Mitigation Measure 5.5.A-4 would reduce Impact 5.4.B-4 to a **less-than-significant** level.

**IMPACT 5.4.B-5** **Littoral Zone Sedimentation.** *This impact is similar to Impact 5.4.A-5, described above for Alternative A. Under Alternative B, the proposed reconstruction and expansion of the existing pier and the relocation of the three existing buoys would be designed and constructed consistent with TRPA Code of Ordinances Section 54.4.B Design and Construction Standards. The expanded pier and relocated buoys would not substantially interfere with littoral processes. The littoral processes with Alternative B are expected to be the same as existing conditions. Therefore, this impact is considered **less than significant**.*

#### Mitigation Measure

No mitigation is required.

### **ALTERNATIVE C—TWO-LOT ALTERNATIVE, MULTIFAMILY RESIDENTIAL**

**IMPACT 5.4.C-1** **Land Coverage.** *Because Alternative C would result in substantial coverage reductions similar to Alternative A, this impact is similar to Impact 5.4.A-1 described above. Alternative C would result in a total of approximately 380,000 sf (8.72 acres) of coverage, a total reduction in site coverage of approximately 77,959 sf (1.79 acres), or 17% from the TRPA-verified coverage (457,959 sf or 10.51 acres). Alternative C would also result in the relocation of some existing coverage, but would not include the proposed SEZ restoration included as part of Alternative A. On the whole, it is expected that the coverage reduction and the relocation of coverage associated with Alternative C would provide a net environmental benefit. For this reason this would be a **beneficial** impact.*

Approximately 149,656 sf (3.44 acres) of the project site is currently designated as LCD 7, which has a base allowable coverage of 30% (44,897 sf or 1.03 acres). However, because the site is developed, the TRPA-verified site coverage in LCD 7 of 78,484 sf (1.80 acres) provides the basis of the allowed coverage for this portion of the project site. Alternative C would reduce coverage in LCD 7 to approximately 66,500 sf (1.53 acres). Although this is approximately 21,603 sf (0.50 acre) over that which would be allowed on an undeveloped site, the coverage proposed under Alternative C would be a reduction of approximately 11,984 sf (0.28 acre) compared to existing conditions.

Approximately 705,345 sf (16.19 acres) of the project site is designated as LCD 1b, which has a base allowable coverage of 1% (7,053 sf or 0.16 acre). However, as explained above for LCD 7, the TRPA-verified coverage in LCD 1b of 381,637 sf (8.76 acres) provides the basis of the allowed coverage for the project site. Alternative C would result in approximately 313,500 sf (7.20 acres) of coverage in LCD 1b (based on a total of 380,000 sf of coverage on the project site and 82.5% of the site being located in LCD 1b). Although this coverage is approximately 306,447 sf (7.04 acres) over the base-allowable 1% coverage that would apply to an undeveloped site, Alternative C would result in a reduction in approximately 68,137 sf (1.56 acres) of coverage compared to the existing TRPA-verified site coverage in LCD 1b.

The applicant would be required to either remove coverage in excess of the LCD base allowable coverage or submit an excess coverage mitigation fee. Beach Club, Inc. would submit an excess coverage mitigation fee to retain the portion of coverage that exceeds the base allowable coverage in LCD 1b and LCD 7, as determined by TRPA Code of Ordinances Section 20.5.A(3). The excess coverage mitigation fee shall be calculated by determining the amount of excess coverage, approximately 328,050 sf (7.53 acres) for the entire project site under Alternative C, in accordance with subparagraph 20.5.A(3)(a) of the TRPA Code of Ordinances. The excess coverage square footage is then multiplied by the appropriate Mitigation Fee Coverage Cost Factor to determine the excess coverage mitigation fee. The mitigation fee coverage cost factor is established by TRPA staff before January 1 of each year, based on a certified real estate appraiser's estimate of the land bank's cost to acquire land coverage under the TRPA Excess Land Coverage Mitigation Fee program. Before project implementation, the proposed mitigation for excess land coverage shall be formalized through a written agreement between TRPA and Beach Club, Inc.

In addition to reducing coverage on the project site, Alternative C would cause a portion of the existing coverage to be relocated. It is expected that, as with Alternative A (see Impact 5.4.A-1 above), Alternative C would be designed or conditioned by TRPA such that with the reduction and relocation of coverage there would be a net environmental benefit to the function of the SEZ. For this reason, this would be a **beneficial** impact.

#### Mitigation Measures

No mitigation is required.

**IMPACT 5.4.C-2** **Seismic Hazards.** *Because Alternative C would be located on the same site as Alternative A, this impact is the same as Impact 5.4.A-2 described above. The project site is located near several faults that could subject the site to ground shaking. Because the Alternative C project components would be designed and constructed in accordance with the current design requirements of UBC Seismic Zone 3, there would be no substantial increased risk of injury or property damage from strong ground shaking or earthquake-induced liquefaction or landslides caused by unstable soils. This is considered a **less-than-significant** impact.*

#### Mitigation Measures

No mitigation is required.

**IMPACT 5.4.C-3** **Non-Seismic Geologic Hazards.** *Because Alternative C would be located on the same site as Alternative A, this impact is the same as Impact 5.4.A-3 described above. The project site is relatively level and is not subject to landslides or mudslides. However, the soils/hydrologic subsurface investigation found loose to medium dense, moist to wet, granular soils in the upper 6 feet of the project site which may exhibit excessive settlement if spread footings are founded within them. This is a **potentially significant** impact.*

**Mitigation Measure 5.4.C-3a. Submit Final Geotechnical Engineering Report and Improvement Plans to TRPA and Douglas County.** See Mitigation Measure 5.4.A-3a described above for Alternative A. The same mitigation would apply.

**Mitigation Measure 5.4.C-3b. Develop and Implement a Dewatering Plan Pursuant to Mitigation Measure 5.5.A-4.** See Mitigation Measure 5.4.A-3b above and Mitigation Measure 5.5.A-4 described in Section 5.5, “Hydrology and Water Quality.” The same mitigation would apply.

**Mitigation Measure 5.4.C-3c. Obtain Grading Permit from TRPA and Douglas County and Ensure that All Earthwork is Monitored by a Geotechnical Engineer.** See Mitigation Measure 5.4.A-3c described above for Alternative A. The same mitigation would apply.

**Mitigation Measure 5.4.C-3d. Perform Project Specific Design Foundation Investigation.** See Mitigation Measure 5.4.A-3d described above for Alternative A. The same mitigation would apply.

Implementation of Mitigation Measures 5.4.C-3a through d would reduce Impact 5.4.C-3 to a **less-than-significant** level.

**IMPACT 5.4.C-4** **Interception of Groundwater Table During Construction.** *Because Alternative C would be located on the same site as Alternative A, this impact is the same as Impact 5.4.A-4 described above. Excavation during construction of Alternative C could intercept the groundwater table, creating the potential for introduction of contaminants to groundwater. Excavation activities for the foundations of the proposed buildings would be approximately 3 to 5 feet. The deepest excavations could reach a maximum depth of approximately 5 to 8 feet below ground surface and groundwater has been encountered within the upper 6 feet of soils on the project site. This is a **potentially significant** impact.*

**Mitigation Measure 5.4.C-4. Develop and Implement a Dewatering Plan Pursuant to Mitigation Measure 5.5.A-4.** See Mitigation Measure 5.5.A-4 described in Section 5.5, “Hydrology and Water Quality.” The same mitigation would apply.

Implementation of Mitigation Measure 5.5.A-4 would reduce Impact 5.4.C-4 to a **less-than-significant** level.

**IMPACT 5.4.C-5** **Littoral Zone Sedimentation.** *This impact is the same as Impact 5.4.A-5, described above for Alternative A. Under Alternative C, the proposed reconstruction and expansion of the existing pier and the relocation of the three existing buoys would be designed and constructed consistent with the provisions of TRPA Code of Ordinances Section 54.4.B Design and Construction Standards relevant to littoral processes. The expanded pier and relocated buoys would not substantially interfere with littoral processes. The littoral processes with Alternative C are expected to be the same as existing conditions. Therefore, this impact is considered **less than significant**.*

**Mitigation Measure**

No mitigation is required.

## **ALTERNATIVE D—NO PROJECT ALTERNATIVE, JERE WILLIAMS PLAN**

Under Alternative D, the existing mobile home park would remain on the project site. The owner would continue the gradual transition to 70% double-wide units and 30% singlewide units and would maintain the total site coverage at no more than the TRPA-verified coverage of 457,959 sf (10.51 acres). With implementation of this alternative, coverage in the area designated LCD 7 would remain at 78,484 sf (1.80 acres), and coverage in the area designated as LCD 1b would remain at 379,475 (8.71 acres) as approved by TRPA. Although the coverage exceeds the base allowable coverage in LCD 7 by 33,587 sf (0.77 acre) and in LCD 1b by 372,422 sf (8.55 acres), the coverage has been verified by TRPA (April 3, 2004) for the project site (Appendix B). Alternative D would not result in relocated coverage.

Although minor improvements would be made to the project site, there would be no substantial construction or excavation; therefore, it is not anticipated that site improvements would encounter groundwater. No additional geotechnical studies would be required for Alternative D. Although no non-seismic geologic hazards are known in the project area, the project site is located near several faults. The risk of damage or injury due to seismic shaking or liquefaction would be the same with under Alternative D as with existing conditions.

The existing pier would remain in place and would not be expanded or improved. Therefore, Alternative D would not have any impacts on littoral processes in the project area.

All geology, soils, and coverage impacts associated with implementation of Alternative D would be **less than significant**.

## **ALTERNATIVE E—NO PROJECT ALTERNATIVE, MANUFACTURED HOUSING**

Under Alternative E, the existing mobile home park would remain on the project site; however, the mobile home park would be closed to allow for all site improvements to be implemented at one time instead of gradually as proposed under Alternative D.

The owner would continue the gradual transition to 70% double-wide units and 30% singlewide units and would maintain the total site coverage at no more than the TRPA-verified coverage of 457,959 sf (10.51 acres). With implementation of this alternative, the percentage coverage designated as LCD 7 would remain at 78,484 sf (1.80 acres), and the percentage coverage designated as LCD 1b would remain at 379,475 (8.71 acres) as approved by TRPA. Although the coverage exceeds the base allowable coverage in LCD 7 by 33,587 sf (0.77 acre) and in LCD 1b by 372,422 sf (8.55 acres), the coverage has been verified and approved by TRPA (April 3, 2004). Alternative D would not result in relocated coverage.

Although site improvements would be made, there would be no substantial construction or excavation and it is not anticipated that site improvements would encounter groundwater. No additional geotechnical studies would be required for Alternative E. Although no non-seismic geologic hazards are known in the project area, the project site is located near several faults. The risk of damage or injury due to seismic shaking or liquefaction would be the same under Alternative E as with existing conditions.

The existing pier would remain in place and would not be expanded or improved. Therefore, Alternative E would not have any impacts on littoral processes in the project area.

All geology, soils, and coverage impacts associated with implementation of Alternative E would be **less than significant**.

## **ALTERNATIVES COVERAGE SUMMARY**

Table 5.4-4, below, compares the land coverage impacts for all of the proposed Beach Club Project alternatives.

**Table 5.4-4  
Summary of Land Coverage Impacts for all Alternatives**

Alternatives	Acres of Coverage Proposed	Allowable Acres of Coverage*	Proposed % Site Coverage	Allowable % Site Coverage	Acres of Coverage in Excess of LCDs	LCD Coverage Mitigation	Impact to Land Coverage
Alternative A	8.24	10.51	42.0%	53.5%	7.05 acres	excess coverage mitigation fee	Beneficial
Alternative B	7.12	10.51	36.3%	53.5%	5.92 acres	excess coverage mitigation fee	Beneficial
Alternative C	8.72	10.51	44.4%	53.5%	7.54 acres	excess coverage mitigation fee	Beneficial
Alternative D	10.51	10.51	53.5%	53.5%	9.32 acres		Less than Significant
Alternative E	10.51	10.51	53.5%	53.5%	9.32 acres		Less than Significant

\*Because the project site is developed, the total allowable acres of coverage is based on the TRPA-verified land coverage of 457,959 sf (10.51 acres) (April 3, 2004).