



**Mail**

PO Box 5310  
Stateline, NV 89449-5310

**Location**

128 Market Street  
Stateline, NV 89449

**Contact**

Phone: 775-588-4547  
Fax: 775-588-4527  
www.trpa.gov

---

STAFF REPORT

Date: October 20, 2022

To: TRPA Hearings Officer

From: TRPA Staff

Subject: ECN Tahoe LLC Land Capability Challenge, 6674 North Lake Boulevard, Placer County, California, APN 117-072-007, TRPA File Number LCAP2022-0299

---

Proposed Action:

Hearings Officer review and approve the proposed Land Capability Challenge.

Staff Recommendation:

Staff recommends the TRPA Hearings Officer approve the land capability challenge on the subject parcel. The challenge would reduce the land capability of Classes 1B and 5 and add Class 6 for the center portion of the property. These changes are itemized on the table on Page 3 and depicted on a map included in Attachment C.

Background:

The subject parcel is mapped as land capability Class 5 and Class 1B. The Soil Conservation Service Soil Survey of Tahoe Basin Area, California-Nevada (Rogers, 1974) identifies the site having Jabu stony sandy loam, moderately fine subsoil variant, 2 to 9% slopes (JhC) and Beaches (Be). The Jabu soil type is derived from alluvium deposited atop ancient lacustrine sediment. While the alluvium can include sand, the soil series is not considered an aeolian (wind-blown) landform (such as dunes, deflation plains). The Beaches soil type consists of recent sand deposits that are largely unvegetated due to wave and wind action. Older deposits of wind-deposited sand typically have trees and/or shrubs, but ground cover may be lacking due to pedestrian use that dislodges shallow-roots forbs and grasses. The vicinity of the parcel has a geomorphic mapping of E-2 for Depositional lands – Outwash, till, and lake sediments (low hazard lands). The subject parcel has a surveyed size of 107,158 square feet (2.46 acres).

An August 29, 1991 Land Capability Verification (LCV) compiled by TRPA staff indicated the site as Class 1B (Beaches), Class 1 B (SEZ) and Class 5 (Attachment C). A land capability challenge (LCAP2022-0299) was filed with TRPA on April 8, 2022. A detailed soil investigation was conducted for this land capability challenge by Davis2 Consulting Earth Scientists. On July 26, 2022, TRPA contractor Phil Scoles, Terra Science, Inc., conducted a site visit with soil scientists Sid Davis and Denny Churchill to examine soil conditions throughout the property (mostly focused on center area).

The contractor's observations of textures, matrix colors, ped structures, horizon depths, gravel volume, and root distribution generally matched the soil consultant's findings (Appendix D). The contractor carefully examined the areas mapped in the 1974 soil survey as Elmira loamy coarse sand, wet variant, with particular attention to the SEZ situated along the southwest portion of the parcel. Specifically, Davis2 Consulting Earth Scientists sampling showed a smaller SEZ size than previously estimated by the 1991 LCV.

Findings:

The subject property consists of a gently sloping plain or terrace that dips to the south (toward Lake Tahoe shoreline). The north part of the property contains a residence and several cabins rented daily or weekly to visitors. There is a paved U-shaped driveway, parking areas, decks and pathways associated with these structures. The north part also includes a large lawn and related landscaped areas. To the south of the cabins, the property is undeveloped except for several storage sheds, outdoor lighting, and beach-related features (shade umbrellas, tables, chairs, etc.). The property has an overstory of lodgepole pine and Jeffrey pine trees, with a few white fir trees and saplings. Due to mowing and landscaping, there are relatively few understory shrubs, like native currant. The southwest corner is slightly lower and supports SEZ vegetation, including quaking aspen, lodgepole pine, Baltic rush, sedges, field horsetail, bentgrass, and other grasses/forbs. Such area meets several SEZ key (primary) indicators, including seasonal high-water table and broadleaf, low elevation woodland. The property lacks any rock outcrops or cut-fill slopes.

For the field investigation, the applicant's consulting soil scientist described several auger holes, hand-dug soil pit and one backhoe-dug pit. Such field work was done between 2000 and 2022 for previous owners, in anticipation of a future land capability challenge. The current owner decided to initiate the challenge in Spring 2022, which required a few additional auger holes (February 2022). The TRPA contactor also hand-augured several holes and the owner's soil consultant tabulated that data and updated the land capability report in early August 2022. The overall density of soil sampling was greater than typical; however, site conditions and nearby land capability challenges warranted greater detail.

In particular, the origin of dune land between Flick Point and Brockway (east of Kings Beach) has been debated for several decades. The soil consultant has accurately characterized this stretch of shoreline has a broad sheet of sand atop older sandy soils, which lie atop ancient lacustrine sediment. Where that lacustrine sediment occurs in the upper 60 inches, the soil is often grouped with the Jabu stony sandy loam, moderately fine subsoil variant (JhC) map unit. Where the sand accumulation is greater, then the soils are considered an unnamed soil, labeled as 'XXX' for land capability challenges. The Tahoe Vista and Kings Beach shorelines are subject to excessive foot traffic that has disturbed vegetation above the natural beach and strong winds from the south and southwest regularly blow sand inland. Several motels and the North Tahoe conference center are constantly removing sand that accumulates on the south faces of buildings, parking lots and pathways.

The subject property is near the western edge of the wind-affected shoreline, and it includes several subtle ridges that have dune-like configurations (flatter on windy side, steeper on lee side). The result of the ongoing disturbance and wind transported sands is buried soils.

The subject parcel has numerous lodgepole pines and several Jeffrey pines that have 1 to 2 feet of accumulated sand burying the tree trunks (see photographs in Appendix B). This phenomenon was observed at many of the soil sampling locations, which had 20 to more than 40 inches of accumulated yellowish-brown sands atop buried soils (distinguished by dark color sands). Both recently deposited sands and buried sands have extensive presence of roots, which indicates both soil materials are utilized by trees, shrubs and herbaceous plants. If not for the ongoing foot traffic disturbance, the soil surface would be partially vegetated with shrubs, grasses and forbs (some bare soil is normal for stabilized sand deposits). This is a critical requirement for soil material, while beaches generally lack rooted material. Beaches typically have wave-washed gravels, and lenses of sandy material reworked underwater or at the shoreline. Ultimately, beaches have a more transient condition and generally have only small pockets (or inclusions) of vegetative material (above and/or below the surface).

The TRPA contractor concurred with the soils consultant's conclusion that the subject land has four categories of soils, namely Beaches (Be), Stream Environment Zone (SEZ), unnamed soil on 0 to 5% slopes (XXX), and unnamed soils on 5 to 16% slopes (XXX). The unnamed soils are split into two map units since the land classification system specifically made Class 7 soils for 0 to 5% slopes and having no root restricting layer in the upper 40 inches. The soils observed do not match the mapped Jabu stony sandy loam, moderately fine subsoil variant (JhC), because they lack lacustrine sediments within the upper 60 inches and the surface deposits are wind-blown (aeolian). The soil consultant's observations correlated with soil redoximorphic concentrations (iron stains) – in the upper 20 inches for SEZs and deeper than 30 to 40 inches for uplands. Thus, the upland soils have moderately well to somewhat excessively drained soils, depending upon the thickness of the recent sand deposits. In accordance with Table 4 of Land-Capability Classification of Lake Tahoe Basin, California-Nevada (Bailey, R.G.,1974), the unnamed soils (designated XXX) qualify as Class 7 for slopes 0 to 5%, Class 6 for slopes 5 to 16%, Class 1B for beaches (any slope), and Class 1B for SEZ (any slope). The table on the following page summarizes the changes in land capability from the 1991 TRPA land capability verification to the 2022 land capability challenge, as concluded by this document.

<b>Land Capability District</b>	<b>Slope Class (Range)</b>	<b>1991 TRPA LCV Area (sq. ft.)</b>	<b>2022 Land Cap. Challenge Area (sq. ft.)</b>	<b>Net Change Total Area (sq. ft.)</b>
Class 1B (SEZ, incl. Ev)	Any Slope	37,082	3,508	-33,574
Class 1B (Be)	Any Slope	53,869	11,112	-42,757
Class 5 (JhC)	2 to 9%	16,207	0	-16,207
Class 6 (XXX)	5 to 16%	0	12,358	+12,358
Class 7 (XXX)	0 to 5%	0	80,180	+80,180
<b>Total Parcel Area</b>		<b>107,158</b>	<b>107,158</b>	<b>0</b>

Contact Information:

This staff report was jointly prepared by TRPA contractor Phil Scoles (Terra Science, Inc.) and TRPA Senior Planner, Julie Roll. If you have questions on this Hearings Officer item, please contact Julie Roll at 775-589-5247 or jroll@trpa.gov.

Attachments:

- A. Vicinity map and TRPA land capability map
- B. Site photographs (July 26, 2022)
- C. August 29, 1991 LCV map and September 2022 Land Capability Challenge recommendation map
- D. Soil consultant's land capability report (Feb. 21, 2022; revised July 28, 2022)

**BAILEY LAND CAPABILITY CHALLENGE FINDINGS**

<b>Site Information</b>	
<b>Assessor's Parcel No. (APN):</b>	117-072-007
<b>TRPA File No. / Submittal Date:</b>	LCAP2022-0299 / April 08, 2022
<b>Owner or Applicant:</b>	EKN Tahoe LLC (Tom Jacobson, Manager); 220 Newport Center Drive, Newport, CA 92660
<b>Site Address:</b>	6674 North Lake Boulevard, Tahoe Vista, Calif. 96148 39.240173° N, -120.054592° W, T. 16N, R. 17E, Sec. 14 (NE 1/4).

<b>Environmental Setting</b>	
<b>Bailey Soil Mapping Unit / Hydrologic Soil Group (HSG) / Land Class / Geomorphic Hazard Unit</b>	Jabu stony sandy loam, moderately fine subsoil variant, 2 to 9% slopes (JhC, HSG-C) and Beaches (Be, HSG-A) / E-2 for Depositional lands – Outwash, till, and lake sediments (low hazard lands as per Bailey Report)
<b>Landform and Soil Parent Material</b>	Windblown (aeolian) deposits over buried alluvial and lacustrine sediments and beach sorted sands / gravels.
<b>Slopes and Aspect</b>	1 to 10% slopes / slopes to south.

<b>Elevation and Datum</b>	6229 to 6337 feet (NAD83 datum, CFA, Inc. Land Surveyors, Civil Engineers, December 16, 2021)
<b>Rock Outcrops and Surface Configuration</b>	No bedrock or surface stones. Some surface gravels present near shoreline.
<b>SEZ and Hydrology Source</b>	Yes, broadleaf low-elevation woodland and lodgepole pine forest sustained by seasonal high water table.
<b>Vegetation</b>	Uplands: Lodgepole pine, Jeffrey pine and white fir. Understory includes pine saplings, currant, silky lupine, turf grasses, clover, yarrow, pinedrops, and forbs/grass. SEZ dominated by quaking aspen, lodgepole pine, saplings, field horsetail, Sierra rush, Baltic rush, sedges, bluegrass, and small forbs.
<b>Ground Cover Condition</b>	Varies. Low for areas of high pedestrian use, but good for naturally vegetated lands and landscaped areas
<b>Site Features</b>	1 residence, several cabins, decks, paved driveway, compacted dirt or barkchip parking, landscaping, SEZ, unvegetated wind-blown sands, and beach.

<b>Field Investigation and Procedures</b>	
<b>TRPA Contractor and Address</b>	Phil Scoles (TRPA subcontractor) Post Office Box 2100; Portland, OR 97208-2100
<b>TRPA Contractor Field Dates</b>	July 26, 2022.
<b>SEZ Mapping / NRCS Hydric Soil</b>	Yes (quaking aspen, lodgepole pine, rushes, horsetail) along west property line, too small for hydric soil mapping
<b>Number of Soil Pits or Auger Holes and Description Depth</b>	Six hand-auger holes, cored to 55+ inches (unless water table encountered where auger hole collapses). Soil consultant recorded soil profiles over several years for different property owners.
<b>Additional or Repetitive TRPA Sample Locations</b>	TRPA contractor hand-augered four holes to examine SEZ area and corresponding upland areas (similar to consultant sampling).
<b>Areas Not Examined</b>	House, cabins, decks, driveway, and parking areas.

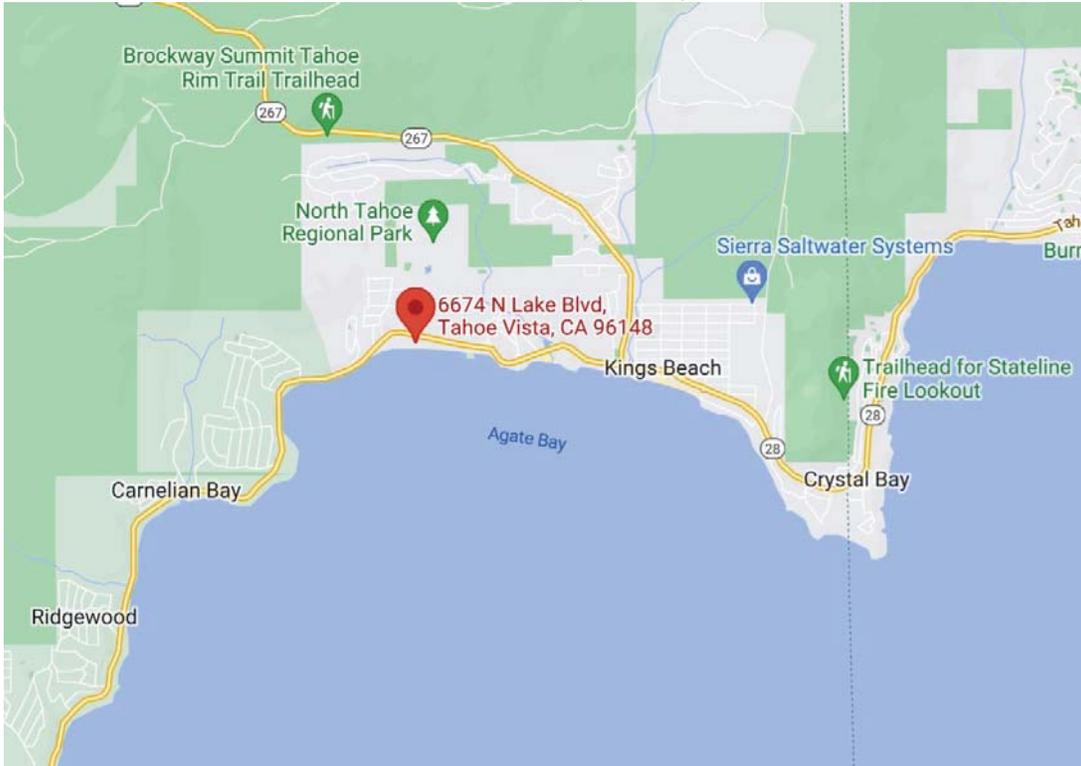
<b>TRPA Findings</b>	
<b>2006 Soil Survey Map Unit<sup>1</sup></b>	Kingsbeach stony sandy loam, 2 to 15% slopes and Beaches (map units 7161 and 7011, Class 6 and Class 1B, respectively).
<b>Consultant Soil Mapping Determination and Rationale</b>	Consultant used multiple hand auger holes and backhoe pit to determine presence of Beaches (Be, HSG-A), SEZ (HSG-D), unnamed soil (5 to 16% slopes, XXX), and unnamed soil (0 to 5% slopes, XXX). The Beaches soil map unit is confined to the south edge of the property parallel to high water line of Lake Tahoe. The SEZ map unit is a small polygon along the southwest property line. The consultant refine the SEZ boundary with additional reliance on redoximorphic features in the upper part. The higher capability soils are deep, moderately well drained to somewhat excessively drained, and no root-restricting layer within 40 to 60 inches of the surface. The higher capability land is divided into 2 map units. – one for the subtle ridges with slopes 5 to 16%, and one for nearly flat, 0 to 5% slopes.
<b>Slope Determination</b>	1 to 10% (slopes to south).
<b>TRPA Conclusion(s)</b>	Overall reduction of Class 1B (Ev), Beaches (Be), and replacement of JhC soils with XXX Class 7 soils. Except for the Beaches soil type, the parcel is a deep, sandy deposit. Pedestrian use of the beach vicinity has eliminated much of the surface vegetation, giving a false impression of natural dune features. Below 6 inches of the sandy surface, there are many plant roots and subtle organic matter staining that indicates the surface conditions would be vegetated if not for the ongoing foot traffic by visitors. When not disturbed by excessive foot traffic, the parcel supports many large diameter lodgepole pine and Jeffrey pine indicating long term stability and soil formation processes.
<b>Applicable Area</b>	Entire property (see map, Attachment C, September 2022).

<sup>1</sup> TRPA currently relies upon the Soil Survey of Tahoe Basin, California-Nevada (Rogers and Soil Conservation Service, 1974), which the Bailey Land Capability system is predicated upon. The 2006 soil survey update has not yet been formally adopted by TRPA for use with land capability matters.

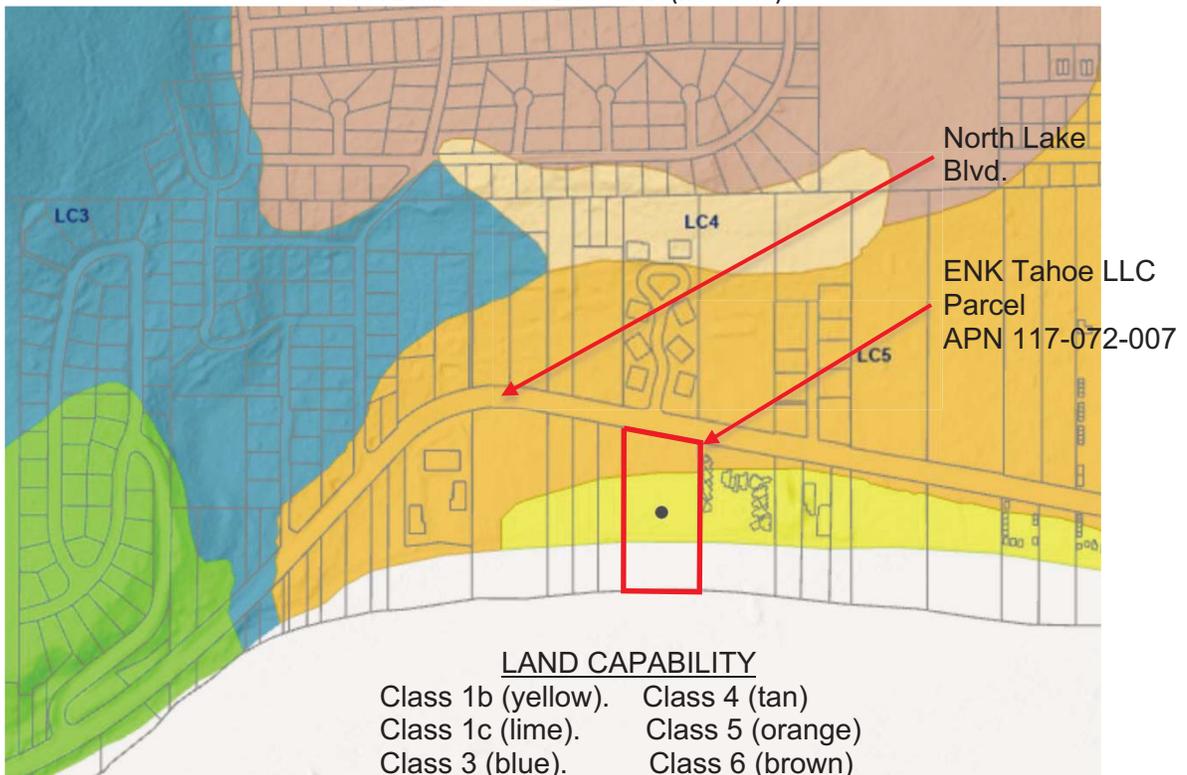
Attachment A

Vicinity map and TRPA land capability map

VICINITY MAP (no scale)



TRPA LAND CAPABILITY MAP (no scale)



Attachment B

Site photographs (July 26, 2022)



**ECN TAHOE LLC PARCEL, 6674 NORTH LAKE BLVD., TAHOE VISTA, CALIF. SITE PHOTOS (APN 117-072-007)**



Photo 1 – View east at lawn area between North Lake Blvd. (also Highway 28) and row of rental cabins (far right edge of photo) . The north part of the property is vegetated with lodgepole pine, Jeffrey pine, and white fir. The understory is mostly landscaped lawn, shrub and scattered native currant shrubs.



Photo 2 – View southeast at land area south of rental cabins. Such area is regularly mowed but not irrigated. The surface is mostly flat, with slight dip to the south. Soils in this vicinity are windblown sand deposits, 10 to 30 inches thick atop buried soils. Pictured area is unnamed, 0 to 5% slopes (XXX, Class 7).



Photo 3 – View southwest at subtle ridge (left side of photo) that has slopes 5 to 16%. Recent sand deposition (via wind action) is 30 to more than 40 inches thick. Baltic rush (often associated with SEZs) grows extensively in sandy deposits by spreading underground via roots (not in response to wetness).



Photo 4 – View east by southeast at south portion of property. Windblown sand noticeably accumulates on windward side of trees and leaves a small hollow on the leeward side. Such accumulation is accelerated by extensive foot traffic that disturbs the soil surface and allows strong southwest to northeast winds to move sands further north into parcel. Pictured area is unnamed soil, 5 to 16% slopes (XXX, Class 6).



Photo 5 – View east by southeast toward subtle ridge that has formed south of several rental cabins and maintenance sheds. Lodgepole pine and Jeffrey pine pre-date sand deposition, which now has buried the original soil the trees became established upon. Understory vegetation is native current and bluegrass.



Photo 6 – View north near southeast property corner. TRPA consultant hand-dug and augered hole in this vicinity to better understand how excessive foot traffic gave area a dune-like appearance. The soil in this vicinity has many roots below 6-inch depth, which indicates such area is stable and does not qualify as beaches. If not for the ongoing foot traffic, such area would likely be partially vegetated with saplings, shrubs and scattered grasses / forbs.



Photo 7 – View southwest at subtle ridge of wind-deposited sand (unnamed soils, 5 to 16% slopes, Class 6). Such ridge is 2 to 3 feet higher than the older sand deposited in the center and right side of photo. The unmowed area in background is slightly lower and qualifies as Stream Environment Zone (SEZ, Class 1B).



Photo 8 – View east along Lake Tahoe shoreline. The area delineated as Beaches is the grayer, more rocky surface below (right) of the patch of Baltic rush (left foreground). Beaches are unconsolidated sands and gravels that generally lack vegetation and rooted material below the surface. Beaches are considered Class 1B.



Photo 9 – View south toward center of delineated SEZ area. The SEZ is dominated by quaking aspen, lodgepole pine, saplings, field horsetail, Baltic rush, sedges, bluegrass and other grasses/ forbs. Such area met SEZ key (primary) indicator for vegetation.

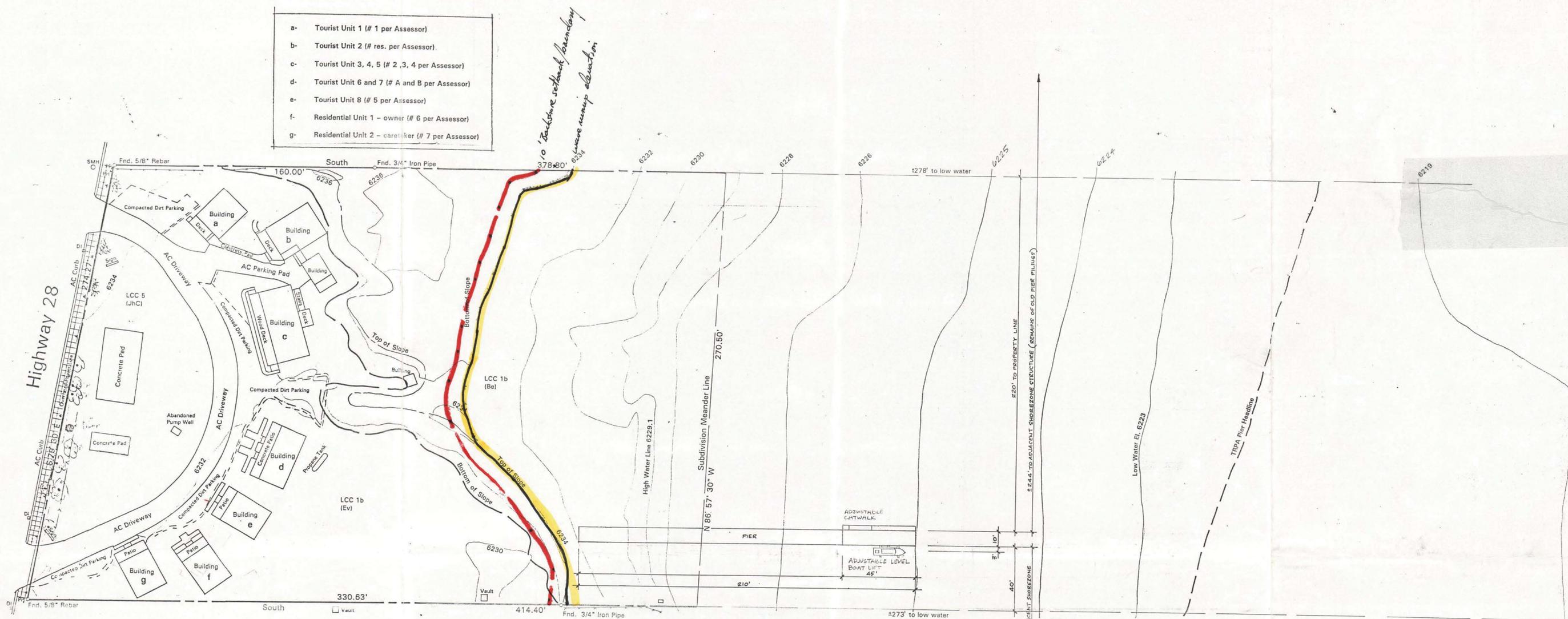


Photo 10 – Close-up view of soil profile for SEZ area near southwest corner of subject parcel. The surface layer (0 to 16 inches) has familiar brown topsoil color, while deeper layers have increasing abundance of iron stains (aka redoximorphic concentrations) and grayer matrix color. Seasonal high water table was present at 46.5 in.

Attachment C

August 29, 1991 LCV map and September 2022 Land Capability Challenge recommendation map

- a- Tourist Unit 1 (# 1 per Assessor)
- b- Tourist Unit 2 (# res. per Assessor)
- c- Tourist Unit 3, 4, 5 (# 2, 3, 4 per Assessor)
- d- Tourist Unit 6 and 7 (# A and B per Assessor)
- e- Tourist Unit 8 (# 5 per Assessor)
- f- Residential Unit 1 - owner (# 6 per Assessor)
- g- Residential Unit 2 - caretaker (# 7 per Assessor)



*Tim Hegen  
is this the appropriate  
setback we discussed -  
Vicky Kalota*

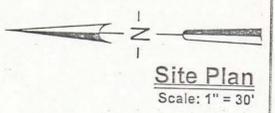
Date	2-20-95
Drawn by	VEB
Revision (L)	By
3-22-95	VEB
8/20/97	SEB
6/1/99	VEB
12-18-00	VEB

Drawings and specifications remain the property of Basin Strategies. Copies of the drawings and specifications retained by the client may be utilized only for the client's use and for supporting the project for which they were prepared, and not for the construction of any other project. These drawings and specifications are not to be reproduced, copied, whole or in part, disclosed, used for construction or for any other purpose without prior written permission from Basin Strategies.

**Basin Strategies**  
 Planning and Consulting Services  
 P.O. Box 11945 Zephyr Cove, NV 89448 (707) 588-8722 Fax 588-8089

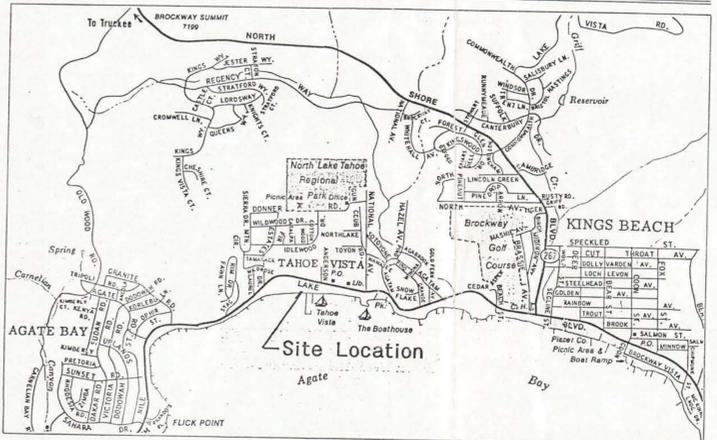
Tahoe Vista, Placer county, CA  
 Lot 14A  
 Agate Bay Subdivision  
 APN 117-072-07

Larry Kramer  
 Beesley Resort  
 Backshore Boundary Determination



Site Plan  
 Scale: 1" = 30'

Vicinity Map

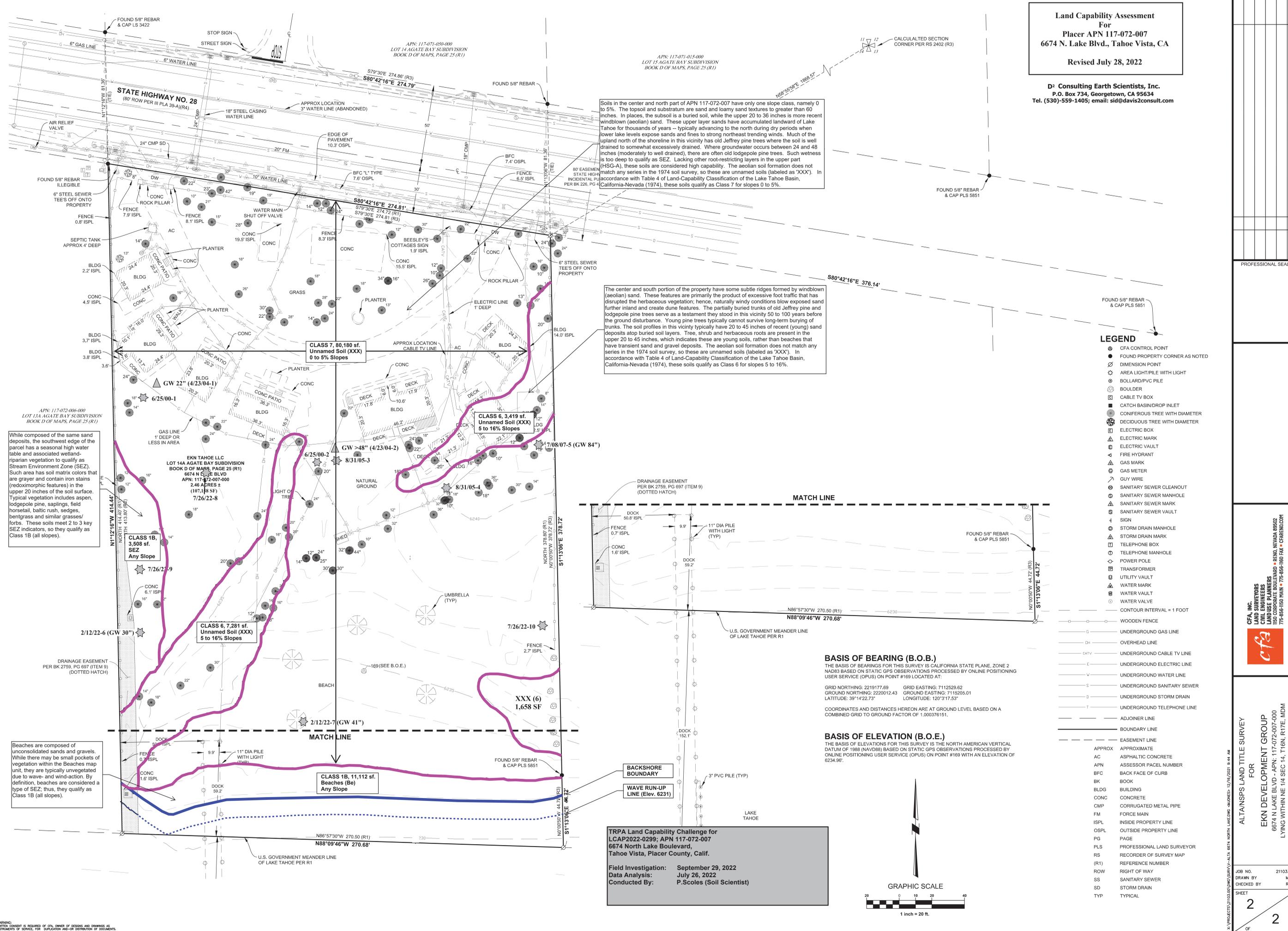


*Tim Hegen  
revised Backshore  
settlement  
TRPA Copy*

**Land Capability Assessment  
For  
Placer APN 117-072-007  
6674 N. Lake Blvd., Tahoe Vista, CA**

Revised July 28, 2022

**D<sup>2</sup> Consulting Earth Scientists, Inc.**  
P.O. Box 734, Georgetown, CA 95634  
Tel. (530)-559-1405; email: sid@davis2consult.com



Soils in the center and north part of APN 117-072-007 have only one slope class, namely 0 to 5%. The topsoil and substratum are sand and loamy sand textures to greater than 60 inches. In places, the subsoil is a buried soil, while the upper 20 to 36 inches is more recent windblown (aeolian) sand. These upper layer sands have accumulated landward of Lake Tahoe for thousands of years – typically advancing to the north during dry periods when lower lake levels expose sands and fines to strong northeast trending winds. Much of the upland north of the shoreline in this vicinity has old Jeffrey pine trees where the soil is well drained to somewhat excessively drained. Where groundwater occurs between 24 and 48 inches (moderately to well drained), there are often old lodgepole pine trees. Such wetness is too deep to qualify as SEZ. Lacking other root-restricting layers in the upper part (HSG-A), these soils are considered high capability. The aeolian soil formation does not match any series in the 1974 soil survey, so these are unnamed soils (labeled as 'XXX'). In accordance with Table 4 of Land-Capability Classification of the Lake Tahoe Basin, California-Nevada (1974), these soils qualify as Class 7 for slopes 0 to 5%.

The center and south portion of the property have some subtle ridges formed by windblown (aeolian) sand. These features are primarily the product of excessive foot traffic that has disrupted the herbaceous vegetation; hence, naturally windy conditions blow exposed sand further inland and create dune features. The partially buried trunks of old Jeffrey pine and lodgepole pine trees serve as a testament they stood in this vicinity 50 to 100 years before the ground disturbance. Young pine trees typically cannot survive long-term burying of trunks. The soil profiles in this vicinity typically have 20 to 45 inches of recent (young) sand deposits atop buried soil layers. Tree, shrub and herbaceous roots are present in the upper 20 to 45 inches, which indicates these are young soils, rather than beaches that have transient sand and gravel deposits. The aeolian soil formation does not match any series in the 1974 soil survey, so these are unnamed soils (labeled as 'XXX'). In accordance with Table 4 of Land-Capability Classification of the Lake Tahoe Basin, California-Nevada (1974), these soils qualify as Class 6 for slopes 5 to 16%.

While composed of the same sand deposits, the southwest edge of the parcel has a seasonal high water table and associated wetland-riparian vegetation to qualify as Stream Environment Zone (SEZ). Such area has soil matrix colors that are gray and contain iron stains (redoximorphic features) in the upper 20 inches of the soil surface. Typical vegetation includes aspen, lodgepole pine, saplings, field horsetail, Baltic rush, sedges, bentgrass and similar grasses/forbs. These soils meet 2 to 3 key SEZ indicators, so they qualify as Class 1B (all slopes).

Beaches are composed of unconsolidated sands and gravels. While there may be small pockets of vegetation within the Beaches map unit, they are typically unvegetated due to wave- and wind-action. By definition, beaches are considered a type of SEZ; thus, they qualify as Class 1B (all slopes).

**LEGEND**

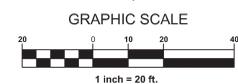
- CFA CONTROL POINT
- FOUND PROPERTY CORNER AS NOTED
- ⊗ DIMENSION POINT
- ⊗ AREA LIGHT/PILE WITH LIGHT
- ⊗ BOLLARD/PVC PILE
- ⊗ BOULDER
- ⊗ CABLE TV BOX
- ⊗ CATCH BASIN/DROP INLET
- ⊗ CONIFEROUS TREE WITH DIAMETER
- ⊗ DECIDUOUS TREE WITH DIAMETER
- ⊗ ELECTRIC BOX
- ⊗ ELECTRIC MARK
- ⊗ ELECTRIC VAULT
- ⊗ FIRE HYDRANT
- ⊗ GAS MARK
- ⊗ GAS METER
- ⊗ GUY WIRE
- ⊗ SANITARY SEWER CLEANOUT
- ⊗ SANITARY SEWER MANHOLE
- ⊗ SANITARY SEWER MARK
- ⊗ SANITARY SEWER VAULT
- ⊗ SIGN
- ⊗ STORM DRAIN MANHOLE
- ⊗ STORM DRAIN MARK
- ⊗ TELEPHONE BOX
- ⊗ TELEPHONE MANHOLE
- ⊗ POWER POLE
- ⊗ TRANSFORMER
- ⊗ UTILITY VAULT
- ⊗ WATER MARK
- ⊗ WATER VAULT
- ⊗ WATER VALVE
- ⊗ CONTOUR INTERVAL = 1 FOOT
- ⊗ WOODEN FENCE
- ⊗ UNDERGROUND GAS LINE
- ⊗ OVERHEAD LINE
- ⊗ UNDERGROUND CABLE TV LINE
- ⊗ UNDERGROUND ELECTRIC LINE
- ⊗ UNDERGROUND WATER LINE
- ⊗ UNDERGROUND SANITARY SEWER
- ⊗ UNDERGROUND STORM DRAIN
- ⊗ UNDERGROUND TELEPHONE LINE
- ⊗ ADJOINER LINE
- ⊗ BOUNDARY LINE
- ⊗ EASEMENT LINE
- ⊗ APPROXIMATE
- ⊗ ASPHALTIC CONCRETE
- ⊗ ASSESSOR PACEL NUMBER
- ⊗ BACK FACE OF CURB
- ⊗ BOOK
- ⊗ BUILDING
- ⊗ CONCRETE
- ⊗ CORRUGATED METAL PIPE
- ⊗ FORCE MAIN
- ⊗ INSIDE PROPERTY LINE
- ⊗ OUTSIDE PROPERTY LINE
- ⊗ PAGE
- ⊗ PROFESSIONAL LAND SURVEYOR
- ⊗ RECORDER OF SURVEY MAP
- ⊗ REFERENCE NUMBER
- ⊗ RIGHT OF WAY
- ⊗ SANITARY SEWER
- ⊗ STORM DRAIN
- ⊗ TYPICAL

**BASIS OF BEARING (B.O.B.)**  
THE BASIS OF BEARINGS FOR THIS SURVEY IS CALIFORNIA STATE PLANE, ZONE 2 NAD83 BASED ON STATIC GPS OBSERVATIONS PROCESSED BY ONLINE POSITIONING USER SERVICE (OPUS) ON POINT #169 LOCATED AT:  
GRID NORTHING: 2219177.89    GRID EASTING: 7112529.62  
GROUND NORTHING: 2220012.43    GROUND EASTING: 7115205.01  
LATITUDE: 39°14'22.73"    LONGITUDE: 120°31'17.53"

**BASIS OF ELEVATION (B.O.E.)**  
THE BASIS OF ELEVATIONS FOR THIS SURVEY IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV88) BASED ON STATIC GPS OBSERVATIONS PROCESSED BY ONLINE POSITIONING USER SERVICE (OPUS) ON POINT #169 WITH AN ELEVATION OF 6234.96'

**TRPA Land Capability Challenge for  
LCAP2022-0299; APN 117-072-007  
6674 North Lake Boulevard,  
Tahoe Vista, Placer County, Calif.**

Field Investigation: September 29, 2022  
Data Analysis: July 26, 2022  
Conducted By: P.Scoles (Soil Scientist)



BY \_\_\_\_\_

REVISIONS \_\_\_\_\_

DATE \_\_\_\_\_

PROFESSIONAL SEAL: \_\_\_\_\_

CFA, INC.  
LAND SURVEYORS  
CIVIL ENGINEERS  
LAND USE PLANNERS  
185 CORPORATE BOULEVARD • REDO, NEVADA 89502  
775-856-1600 MAIN • 775-856-1600 FAX • CFARENDO.COM

ALTAIRNSP LAND TITLE SURVEY FOR EKN DEVELOPMENT GROUP  
6674 N LAKE BLVD - APN: 117-072-007-000  
LYING WITHIN NE 1/4 SEC 14, T16N, R17E, 10MD  
PLACER COUNTY CALIFORNIA

JOB NO. 21103.00  
DRAWN BY M/J  
CHECKED BY ROL  
SHEET 2 OF 2

AGENDA ITEM NO. V.B

WARNING: WRITING CONSISTENT WITH CALIFORNIA BOARD OF SURVEYING AND MAPPING ACTS AND RULES IS REQUIRED OF CFA, OWNER OF DESIGNS AND DRAWINGS AS INSTRUMENTS OF SERVICE, FOR DUPLICATION AND/OR DISTRIBUTION OF DOCUMENTS.

Attachment D

Soil consultant's land capability report (Feb. 21, 2022; revised July 28, 2022)

# DAVIS<sup>2</sup>

## CONSULTING EARTH SCIENTISTS

P.O. Box 734 · Georgetown, CA 95634 · Tel. (530) 559-1405; [davis2consulting@sbcglobal.net](mailto:davis2consulting@sbcglobal.net)

### Land Capability Challenge 6674 N. Lake Boulevard Tahoe Vista, Placer County, California (APN 117-072-007)

February 21, 2022  
(July 28, 2022, Revision)

#### INTRODUCTION

Soil investigations have been conducted on the parcel on 6674 N. Lake Tahoe Boulevard, Tahoe Vista, Placer County, California intermittently since 2000. The objective of study is to identify soils and other features and relate them to Land Capability, which is administered by the Tahoe Regional Planning Agency (TRPA) for the purpose impervious coverage regulation, by Chapter 30 of the TRPA Code of Ordinances.

The parcel is a commercial lodging resort, consisting of a private residence and four additional rental cabins formerly known as the Beasley's Cottages (Figure No. 1).

6674 North Lake Boulevard  
(Placer County APN 117-072-007)



Figure 1- Project Location, Tahoe Vista

New ownership under EKN Tahoe LLC, is requesting clarification of Land Capability via a Land Capability Challenge (LCC), because currently there is no formal LCC on file with the TRPA. A Land Capability Verification (LCV) has been the guiding reference for Land Capability at this site since 8/29/91 (IPES/Land Capability Office).

A LCC uses detailed soil description and mapping to deconstruct a broader existing Order 2 soil map unit (SMU), which may include several soil types, into higher resolution capability districts. These districts are defined by the soils that have developed by specific processes on the landscape. A broad SMU, such as the miscellaneous land type Beaches (map unit Be), may contain several soil types within the Tahoe basin-wide mapping effort, but soils within the SMU may or may not be named. Regardless, soils within any SMU complex generally occupy a discrete landscape position. These are sorted out in an LCC.

Soil information contained in this report is for the strict use of land capability and it should not be used for building foundation design, slope stability, hazard waste assessment or seismic analyses.

This report has been revised to reflect conditions found on July 26, 2022 as a result of review by TRPA contract soil scientist Phil Scoles sit visit. Additional soils data and a slight revision of SEZ is reflected in this revision.

#### ENVIRONMENTAL SETTING

The site is located at 6674 North Lake Boulevard, Tahoe Vista, Placer County, California. Vegetation consists of Jeffrey pine, lodgepole pine, Incense cedar and few aspens located along the west property line. Slopes range between 2 and 5 percent on a southerly aspect. Stream environment zone (SEZ) is identified at one locale by primary vegetation (Aspen trees), and the lake front constitutes Be (beaches) along the lake frontage.

Geology (Mathews 1968) is characterized as Q1 (Recent Lake beds). Bailey's (1974) geomorphic analysis shows the parcel within E<sub>2</sub> (Outwash, till and lake deposits). Soils are shown on TRPA map sheet E-4 as JhC (Jabu stony sandy loam, moderately fine subsoil variant, 2 to 9 percent slopes) and Be (Beaches).

The number of acres of the Be unit fluctuates annually with high-low water line. Basin-wide, with 72 miles of shoreline, it is estimated that the figure varies between about 100 and 1,000 acres depending on the amount of exposed sand-gravel area between high and low water line. Every lakefront parcel in the Tahoe Basin has a Be unit except where rock outcrop encroaches far out into the lake. Every lakefront parcel where a challenge is produced ends up with a Be designation although the Soil Survey (1974) may not show Be at all locations.

### METHODOLOGY

The parcel was surveyed as well as areas nearby. Seven soil profile descriptions considered representative of the landforms were chosen over a period of approximately 20 years as a result of several site visits, beginning in the year 2000 (Appendix 2). Excavations were placed by hand auger and backhoe to open and examine the soil profiles in detail. Standards of the National Cooperative Soil Survey were used to describe and interpret soil physical properties. Groundwater levels were confirmed visually, depths tape measured from the natural ground surface on various dates. Information gathered at the site was compared to the *Soil Survey of the Lake Tahoe Basin, California-Nevada* (Rogers et al, 1974) and to the *Land-Capability Classification of the Lake Tahoe Basin, California-Nevada* (Bailey, 1974) for proper placement in the appropriate land capability class. A detailed topographic base map supplied by CFA, Inc. (Appendix 2) was available in the field for ground control and slope analysis. Information pertaining to land capability districts is shown on the base map.

Over the years several very seasoned soil scientists and geologists have been involved with this project representing Davis<sup>2</sup>, or Larry and Sharon Kramer, including Sidney W. Davis, CPSS; Marie L.E. Davis, PG, CPSS; John H Rogers, CPSS; Denny M. Chruchill, CPSS; Roy J. Shlemon, PhD, PG, CPG, CPESC; and Maia C. Davis, PG.

### FINDINGS

Soils are found to be deep with high infiltration rates (sand) and moderately well to excessively drained, members of Hydrologic Soil Groups (HSG) A and B. The beach area is in the lake swash zone and where depth to groundwater is measured at less than 20 inches (HSG D).

The moderately well drained soils can be characterized as having dark brown sand topsoil over dark brown sand subsoil, abruptly underlain by very dark brown or black sand (buried surfaces) derived from eolian sources with groundwater measured in the range of 22 inches to 30 inches. The elevation of the groundwater table was in the range of 6,231 feet (6/23/00; 4/23/04; 8/31/05; 2/12/22) over most of the site. Excessively drained soils at elevations above 6,235 feet have groundwater depths well beyond 48 inches (6/23/00; 4/23/04) and 84 inches (7/8/07).

Based on soil descriptions made at three additional sites, two along the eastern property boundary, soils were found to be moderately well drained and members of HSG B. The SEZ boundary was expanded slightly to reflect new aspen tree sproutings, invading the property from the parcel along the east side. Expansion of this SEZ is based solely on primary SEZ vegetation (Aspen) encroachment. The western description site is consistent with other soils associated with eolian materials outside of the SEZ area, excessively drained, with a buried surface at approximately 36 inches below the natural and no evidence of groundwater in the upper 60 inches.

The Be unit is determined to reside below elevation 6,233 feet, where wave runup and the groundwater table reaches to within 20 inches of the natural ground surface.

### INTERPRETATIONS

The landform at Tahoe Vista consists of accretionary deposits derived from the exposed shoreline below high and low surface water during periods when the lake level dropped below the spillway at the dam at Tahoe City (Elevation 6,229.1 feet). Deposits at 6674 North Lake Boulevard, and elsewhere in Tahoe Vista and Kings Beach, constitute a sand sheet, composed dominantly of 0.05-1.0 mm sand, and are devoid of coarse sand (1.0-2.0 mm) and gravel size (2.0 mm – 75.0 mm) aggregates. Similar eolian deposits are identified in the area through other soil investigations performed by Davis<sup>2</sup>, well north of State Route 28 at this locale and extending for some distance to the east end of Kings Beach, which measure at a minimum 200 acres (Figure No. 2).

### Approximate Extent of Sand Sheet in Tahoe Vista - Kings Beach Areas



Figure 2- Sand sheet area at Tahoe Vista-Kings Beach.

The landform is predominantly vegetated with mature mixed conifer. One older cedar tree on the subject property (above elevation 6,240 feet), showing as 80 inches in diameter on the LCV map (Figure 3), was removed sometime between 2007 and 2022. On its measured stump radius of 36 inches, approximately 16-18 tree rings per inch were counted (Figure 4). Assuming one tree ring forms per year of growth, the estimated age

of the tree is around 576-648 years old. The presence of a tree this size/age is indicative of relatively long-term landscape stability.

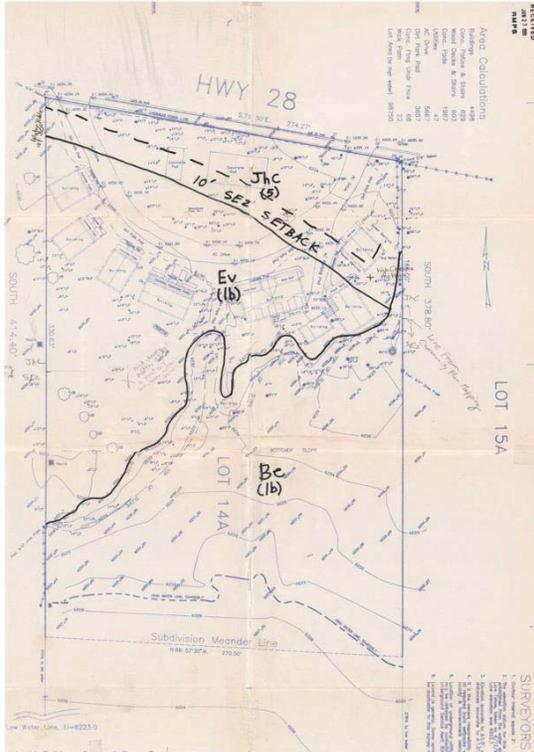


Figure 3 - LCV (TRPA, 1991)



Figure 4 - Cedar tree stump, 36" radius.

From the base of a soil pit at Stop No. 5 (2007) (Figure 3), approximately 10 feet distance due west of the old tree, a sample of organic carbon in a buried soil horizon was retrieved at 84 inches depth. Radiocarbon dating aged the buried surface at approximately 1,500 years before present (Beta Analytical, 2007). Presence of the buried organic-rich surfaces documents long periods of upland stability and therefore the landform is other than a beach, contrary to how it was initially mapped by the 1974 Soil Survey. The landform above 6,233 feet elevation is interpreted to have been above the swash zone for more than 1,500 years, based on the radiocarbon date (Beta Analytical, 2007) collected beneath the permanent tree canopy at 84 inches depth near the large cedar tree.

Lake Tahoe surface records (Adams, 2001) show that, in the last 100 years, the highest Lake Tahoe water surface occurred at elevation 6,231 feet in 1907 (Figure 5), thus establishing the highest elevation of beach extent in the last 100+ years. These data indicate that since 1900, a beach environment did not reach extents currently mapped on the TRPA LCV map (1991) or the 1974 Tahoe Basin soil survey.

Adams (2001) also shows that lake levels have been below the Tahoe City dam spillway (Elevation 6,229.1 feet) for approximately 70 percent of the last century, indicating that the swash zone between historically high and low water levels has been left exposed along the rim of lake. These areas of exposed sediment provide a source for windblown material. Given that the prevailing winds are from south to north (Western Regional Climate Center, 2022), areas above the shoreline in and around Tahoe Vista-Kings Beach are prone to accumulate eolian materials well above the historic high-water line. Where the eolian material is thickest, HSG A is interpreted. Where the eolian material is greater than 20 inches but less than 40 inches to seasonal groundwater table from the present ground surface, HSG B is interpreted (NRCS 2009). Soils in HSG A and B, according to Bailey's (1974) criteria, place Land Capability in Class 7 where slopes are less than 5 percent gradient.

21 of 27

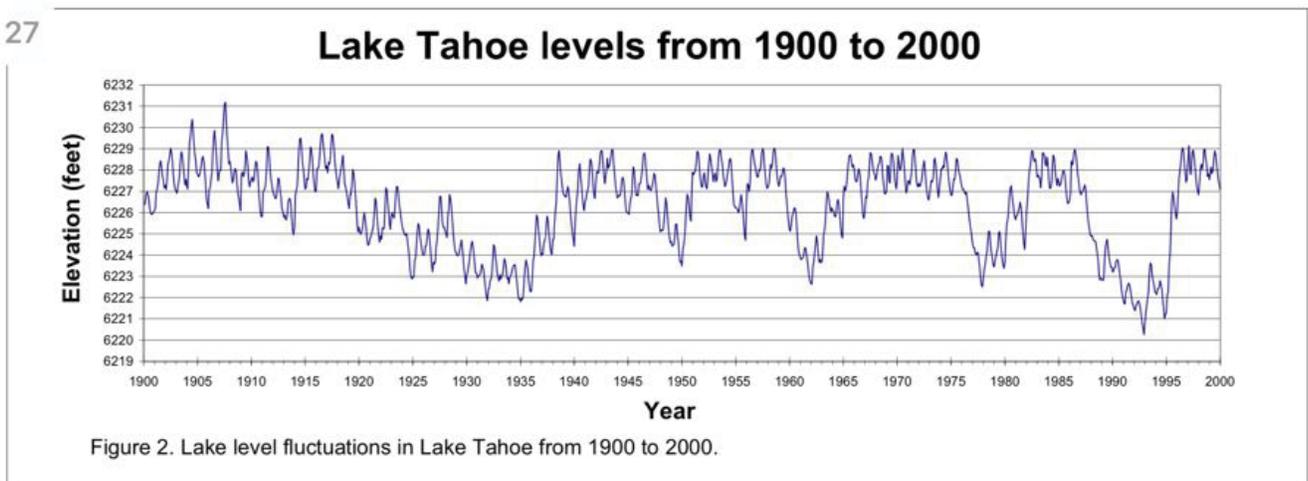


Figure 5- Lake level elevations (Adams, 2001)

A limited area of Aspen trees (Figure 6) growing along and within the drainage easement along the west property line (Appendix 2) justify SEZ by primary indicators.



Figure 6 - SEZ area.

Soils found in all areas of the project site are different than those shown on the 1974 NRCS Tahoe Basin soil survey and TRPA LCV map sheet (1991) because they show characteristics other than either Jabu or Beach. Additionally, the TRPA LCV has Elmira wet variant (Ev) mapped, which is inconsistent with the NRCS (1974) SMUs and Bailey (1974) overlays.

Soils currently mapped as Jabu moderately fine subsoil (JhC) on the project site are found by Davis<sup>2</sup> to consist of sand or loamy sand throughout to depth with buried surfaces expressed as abrupt increases in organic matter, thick, very dark brown or black, Ab horizons, which are soil characteristics not consistent with the Jabu series. The JhC soils presented in the Soil Survey (Rogers, 1974) are typically described as having a sandy clay loam at 19 to 29 inches and light gray clay lake sediments below, which are absent on this project site.

Likewise, soil mapped as Beach (Be) above elevation 6,233 feet are above the swash zone and have buried surface horizons, indicative of long-term stability. Although they consist of sand, the material is other than water-borne and inconsistent with the geomorphic definition of beach. The formal definition of beach is:

“Beach - A gently sloping area adjacent to a lake or ocean that lies between the low and high water marks, which is devoid of vegetation, and is composed of unconsolidated material, typically sand or gravel, deposited by waves or tides.” (Glossary of Soil Science Terms (<https://www.soils.org/publications/soils-glossary/#>)).

The SMU description of Be in the 1974 Soil Survey is rather vague:

Beaches (Be) is adjacent to the lake shore, mainly the south shore near Kings Beach [sic]. It is coarse sand derived mainly from granitic alluvium.” (Rogers et al, 1974)

The modern beach expresses coarse gravel deposits, including coarse sand and finer materials in and below the swash zone (Figures 7 and 8). Stop No. 7 (Appendix 2) is near the second inland umbrella stand at an elevation of 6,234 feet. The presence of gravels and coarse sands are absent landward within the eolian deposits. Groundwater was encountered at this site 41 inches below ground surface, putting the water table slightly above 6,230 feet elevation, thus placing the Be delineation lakeward of and below elevation 6,233 feet contour. Adams (2004) design storm wave transect locations numbers 55 and 56 place wave runup elevation at this site at 6,230 feet elevation.



Figure 7 – Gravel associated with the Be unit.



Figure 8- Geologist marking the Be / Upland boundary.

#### CONCLUSIONS AND RECOMMENDATIONS

The purpose of a Land Capability Challenge (LCC) is to identify soils and, if possible, relate them to known soil series or SMUs in the 1974 Soil Survey. Discovery by detailed investigation at 6674 N. Lake Blvd. identifies soils different than those mapped in 1974 by the Soil Conservation Service and Forest Service, which place in higher land capability than what was initially assigned by Bailey (1974). If unnamed soils are found, those outside the range and characteristics of either the series or the SMU are interpreted for Hydrologic Soil Group, slopes are measured, and then the soils are rated according to Bailey’s (1974) *Table 4 – Basis of capability classification for Lake Tahoe Lands*.

According to this table, soils with 0-5 percent slope and low to moderately low runoff potential are placed in hydrologic groups A and B, and Class 7 is the appropriate Capability level. Where soils measure above 5 percent slope but less than 16 percent slopes, they place in Class 6.

Soils described at 6674 N. Lake Blvd. are associated with the sand sheet that covers the area around Tahoe Vista and Kings Beach (Figure 2). The soils described are very deep and moderately well or excessively drained. HSG A is assigned where the groundwater table is at 40 inches below ground surface. HSG B is assigned where the groundwater table resides between 20-40 inches. For land capability assessment the entire parcel from State Route 28 to the area of lake wave runup (Appendix 2) is interpreted to place in Land Capability Classes 6 and 7. The exception is one small area supporting aspen trees, which are a Primary SEZ indicator, located along the west property line, mainly within a drainage easement.

There are no supporting soil profile descriptions that substantiate a classification of Ev (Elmira loamy coarse sand, wet variant), which appears to have been changed from the Soil Map Unit (SMU) JhC on the LCV map. Procedures for an LCV allow for change within the SMU's named series based solely on slope differences (TRPA Code 30.3.3.D.). For example, JhC (Jabu very stony sandy loam, moderately fine subsoil variant, 2 to 9 percent slope) could be changed to JaD (Jabu coarse sandy loam, 9 to 20 percent slope) if the slope was measured in the field to be greater than 9 percent. LCV procedures do not allow for JhC to be changed to another series name, such as Ev. Soil map unit names may only be changed in an LCC. This site has not had an approved LCC to date, making the 1974 Bailey classifications of JhC and Be the SMUs to be challenged at this site – the Ev classification on the TRPA 1991 LCV is null.

Soils described during this investigation are inconsistent with the JhC classification and are unnamed in the soil survey in the Tahoe Basin. They are classified as XXX and have no SMU. These soils are moderately well to excessively drained and fit the criteria for Classes 6 and 7 under Bailey's (1974) capability rating. The square footage of these coverage classes is listed in Table 1.

The mature conifer vegetation reaching ages exceeding 500 years old and buried soil horizons dated to 1,500 years before present indicate long term landform stability uninfluenced by wave action on this property. Lake level information (Adams 2001) confirms that a beach environment did not exist in this location to the extent at which it is currently mapped. The delineation of Be should be moved lakeward of the 6,233 foot contour on the LCC map provided in Appendix 2. The square footage of the Be is listed in Table 1.

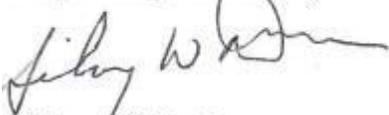
**Table 1: Land capability classes and allowable coverage**

Soil Land Capability Class	% Allowable Coverage	Ft <sup>2</sup> Mapped on Parcel
XXX (7)	30	80,180
XXX (6)	30	12,358
Be (1b)	1	11,112
SEZ (1b)	1	3,508
<b>TOTAL</b>		<b>107,158</b>

The attached map is the resultant of additional field work as a collaborative effort between the owner's representatives and TRPA's contract soil scientist consultant on July 26, 2022.

Please refer to the soil profile description(s) (Appendix 1) that support the findings and the attached map (Appendix 2) showing the spatial distribution of the appropriate land capability class(s) on the parcel.

Respectfully submitted,



Sidney W. Davis,  
CPSS /SC No. 1031

**APPENDIX 1: SOIL PROFILE DESCRIPTIONS**

### Representative Soil Profile Descriptions

#### Stop No. 1 (6/25/00 SWD/ JHR)

- C 0 – 4 inches, pale brown (10YR 6/3) moist; sand; single grain; soft, loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; slightly acid; gradual smooth boundary.
- Ab 4 – 7 inches, black (10YR 2/1) moist; sand; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; slightly acid; clear smooth boundary.
- Bw1 7 – 31 inches, dark brown (7.5YR 3/4) moist; loamy sand; single grain; soft, loose, nonsticky and nonplastic; many fine medium and few coarse roots; many very fine and fine interstitial pores; neutral; gradual smooth boundary.
- Bw2 31 – 40 inches, brown (7.5YR 4/4) and many medium fine redox concentrations of reddish brown (5YR 4/4) moist; loamy sand; single grain; soft, loose, nonsticky and nonplastic; common fine medium coarse roots; many very fine and fine interstitial pores; neutral.

Notes: Groundwater measured at 31” 6/23/00. SHG B

Soil Series: Unnamed

Soil Classification: Sandy, mixed, frigid, Humic Dystroxerepts

Drainage Class: Moderately well

Soil Hydrologic Group: B



Figure 9 - Looking west, area of Stop 1 and GW 1.

#### Stop No. 2 (6/23/00, SWD/JHR)

- C 0 – 46 inches, pale brown (10YR 6/3) moist; sand; single grain; soft, loose, nonsticky and nonplastic; many very fine and fine interstitial pores; clear smooth boundary.

- Ab 46 – 60 inches, dark brown (10YR 3/3) moist; sand; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; clear smooth boundary.
- Bw1 60 – 80 inches, dark brown (7.5YR 3/4) moist; loamy sand; single grain; soft, loose, nonsticky and nonplastic; common fine medium roots; many very fine and fine interstitial pores; clear smooth boundary.
- Bw2 80 – 120 inches, brown (7.5YR 4/4) moist; loamy sand; single grain; soft, loose, nonsticky and nonplastic; common fine medium roots; many very fine and fine interstitial pores.

Groundwater measured at 86” 6/23/00. SHG: A

Soil Series: Unnamed (XXX)

Soil Classification: Sandy, mixed, frigid, Humic Dystroxerepts

Soil Drainage Class: Excessive

Hydrologic Soil Group: A

**Stop No. 3** (8/31/05, DMC)

- A1 0 – 5 inches, pale brown (10YR 6/3) sand, brown (10YR 4/3) moist; single grain; soft, loose, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; slightly acid; gradual smooth boundary.
- A2 5 – 20 inches, pale brown (10YR 6/3) sand, brown (10YR 4/3) moist; single grain; soft, loose, nonsticky and nonplastic; few to common fine medium coarse roots; many very fine and fine interstitial pores; slightly acid; gradual smooth boundary.
- Ab 20 – 26 inches, dark brown (10YR 3/3) loamy sand near sand, very dark brown (10YR 2/2) moist; moderate medium granular structure; soft, loose, nonsticky and nonplastic; many fine medium roots; many very fine and fine interstitial pores; neutral; abrupt smooth boundary.
- Bw1 26 – 36 inches, strong brown (7.5YR 5/9) loamy sand near sand, brown (7.5YR 4/4) moist; single grain; soft, loose, nonsticky and nonplastic; few fine roots; many very fine and fine interstitial pores; neutral; gradual smooth boundary.
- Bw2 36 – 48 inches, yellowish red (5YR 4/6) mottled with matrix of brown (7.5YR 5/4) and (7.5YR 4/4), moist; loamy sand near sand; single grain; soft, loose,

nonsticky and nonplastic; few fine roots; many very fine and fine interstitial pores; neutral; gradual smooth boundary.

Notes: Groundwater at 56" in well #2

Soil Series: Unnamed (XXX)

Soil Classification: Sandy, mixed, frigid, Humic Dystroxerepts

Soil Drainage Class: Excessive

Hydrologic Soil Group: A



Figure 10 - Looking west, area of Stops 2, 3, 4 and GW 2.

#### Stop No. 4 (8/31/05, DMC)

- A1 0 – 3 inches, brown (10YR 5/3) sand dark brown (10YR 3/3) moist; weak very fine granular structure; soft, loose, nonsticky and nonplastic; common fine medium and coarse roots; gradual smooth boundary.
- A2 3 – 10 inches, very pale brown (10YR 7/3) sand, brown (10YR 4/3) moist; single grain; soft, loose, nonsticky and nonplastic; common fine medium and coarse roots; gradual smooth boundary.
- C1 10 – 22 inches, very pale brown (10YR 7/4) sand, yellowish brown (10YR 5/4) moist; single grain; soft, loose, nonsticky and nonplastic; common fine medium and coarse roots; gradual smooth boundary.
- C2 22 – 44 inches, very pale brown (10YR 7/4) loamy sand near sand, yellowish brown (10YR 5/4) moist; single grain; soft, loose, nonsticky and nonplastic; many fine medium and coarse roots; gradual smooth boundary.
- 2Ab 44 – 52 inches, brown (10YR 4/3) loamy sand near sand, dark brown (10YR 3/3) moist; weak fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium and coarse roots; abrupt smooth boundary.

Bw 52+ inches, brownish yellow (10YR 6/9) loamy sand near sand, brown (7.5YR 4/4) moist; weak fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium and coarse roots; gradual smooth boundary.

Notes: Charcoal deposits at 50 inches. Eolian sand stabilized by mature trees and mixed grasses. Groundwater > 6'. SHG: A

Soil Series: Unnamed

Soil Classification: Sandy, mixed, frigid, Humic Dystrocherepts

Drainage Class: Excessive

Hydrologic Soil Group: A

**Stop 5 (7/08/07, SWD, MLED, RJS)**

A 0 to 6 inches, light brownish gray (10YR 6/2) sand, brown (10YR 5/3) moist; weak very fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine interstitial pores; slightly acid; clear smooth boundary.

C1 6 to 16 inches, very pale brown (10YR 7/3) sand, pale brown (10YR 6/3) moist; single grain; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine interstitial pores; slightly acid; clear smooth boundary.

C2 16 to 38 inches, very pale brown (10YR 7/3) sand, pale brown (10YR 6/3) moist; single grain; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine interstitial pores; slightly acid; clear smooth boundary.

2Ab 38 to 43 inches, brown (10YR 5/3) sand, dark brown (10YR 3/3) moist; weak very fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine interstitial pores; slightly acid; charcoal; gradual wavy boundary.

2C 43 to 51 inches, light yellowish brown (10YR 6/4) sand, yellowish brown (10YR 5/4) moist; single grain; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine interstitial pores; slightly acid; clear smooth boundary.

3Ab 51 to 59 inches, brown (10YR 5/3) sand, dark brown (10YR 3/3) moist; weak very fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine interstitial pores; slightly acid; charcoal; gradual wavy boundary.

- 3C 59 to 80 inches, light yellowish brown (10YR 6/4) sand, yellowish brown (10YR 3/4) moist; single grain; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine interstitial pores; slightly acid; clear smooth boundary.
- 4Ab 80 to 84 inches, sand, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine interstitial pores; neutral; charcoal; gradual wavy boundary.
- 4C 84+ inches, sand, dark yellowish brown (10YR 3/4) moist; massive; soft, loose, nonsticky and nonplastic; neutral.

Note: 38” buried soil – 5” thick, “lack of concentrated magnetite indicates bioturbation /stability.” 51 – 59” buried soil – 8” thick 80” buried soil – 4” thick (radio-carbon sample from here).

Soil Series: Unnamed (XXX)

Soil Classification: Mixed, frigid, Dystric Xeropsamments

Soil Drainage Class: Excessive

Hydrologic Soil Group: A



Figure 11 - Stop 5 looking west. roots.



Figure 12 - Stop 5 excavation, note many roots.

**Stop No. 6 (SWD, MCD 2/10/22)**

- Oi 0 – 1/2 inch, leaves
- A 1/2 - 4 inches, very dark grayish brown (10YR 3/2) moist; sand; weak fine granular structure; soft, loose, nonsticky and nonplastic; common fine medium

- roots; many very fine and fine interstitial pores; slightly acid; clear smooth boundary.
- Bw1 4 – 18 inches, dark brown (7.5YR 3/4) moist; sand; moderate medium granular structure; soft, loose, nonsticky and nonplastic; common fine medium roots; many very fine and fine interstitial pores; neutral; abrupt smooth boundary.
- 2Ab 18 – 22 inches, black (10YR 2/1) moist; sand; weak fine granular structure; soft, loose, nonsticky and nonplastic; common fine medium and few coarse roots; many very fine and fine interstitial pores; neutral; gradual wavy boundary.
- 2Bw2 22 – 28 inches, dark brown (7.5YR 3/3) moist; sand; moderate medium subangular blocky structure; soft, loose, nonsticky and nonplastic; common fine medium and few coarse roots; many very fine and fine interstitial pores; gradual wavy boundary.
- 3Bw3 28 – 30 inches, dark brown (10YR 3/3) moist; sand; moderate medium subangular blocky structure; soft, loose, nonsticky and nonplastic; common fine medium and few coarse roots; many very fine and fine interstitial pores; neutral; twenty percent gravel.

Note: Buried A at 18 inches.

Soil Series: Unnamed (XXX)

Soil Classification: Sandy, mixed, Oxyaquic Dystrocherepts

Soil Drainage Class: Moderately well drained

Soil Hydrologic Group: B



Figure 13- Stop 6, auger hole and soil material.

**Stop No. 7 (SWD, MCD (2/10/22))**

- C1 0 – 30 inches, olive brown (2.5Y 4/3) moist; sand; single grain; soft, loose, nonsticky and nonplastic; many very fine and fine interstitial pores; neutral; clear smooth boundary.
- C2 30 – 36 inches, dark yellowish brown (10YR 3/4) moist; sand; single grain; soft, loose, nonsticky and nonplastic; many very fine and fine interstitial pores; neutral; abrupt smooth boundary.
- Ab 36 – 40 inches, very dark grayish brown (10YR 3/2) moist; sand; weak fine subangular blocky structure; soft, loose, nonsticky and nonplastic; many very fine and fine interstitial pores; neutral; gradual wavy boundary.
- Bw 40 – 45 inches, dark brown (7.5YR 3/4) moist; sand; weak fine subangular blocky structure; soft, loose, nonsticky and nonplastic; many very fine and fine interstitial pores; neutral.

Note: Buried A at 36 inches. Groundwater at 41 inches.

Soil Series: Unnamed (XXX)

Soil Classification: Mixed, frigid, Typic Xeropsamments

Soil Drainage Class: Excessive

Soil Hydrologic Group: A



**Figure 14 - Stop 7, auger hole and soil material**

**Stop 8 (7/26/22)**

- A1 0 to 6 inches, brown (7.5YR 4/2), moist, fine sand; moderate medium granular structure; soft, loose, nonsticky and nonplastic; many fine and medium roots; many very fine and fine interstitial pores; clear smooth boundary.
- A2 6 to 16 inches, brown (7.5 YR 4/3), moist, fine sand; weak fine granular structure; soft, loose, nonsticky and nonplastic; few fine roots; many very fine interstitial pores; gradual smooth boundary.
- Bw1 16 to 31 inches, brown ((7.5YR 4/4) with few faint and fine redox concentrations of strong brown (7.7YR 4/6), abrupt boundary across color interface, fine sand; single grain; soft loose, nonsticky and nonplastic; gradual smooth boundary.
- 2Ab1 31 to 46 inches, brown (7.5YR 4/2) with common medium distinct redoximorphic concentrations of strong brown (7.5YR 4/4) fine sand; single grain; soft, loose, nonsticky and nonplastic; gradual smooth boundary.
- 2Ab2 46 to 60 inches, brown (7.5YR 4/2) with common medium distinct redoximorphic concentrations of strong brown (7.5YR 4/4), sand; single grain; soft, loose, nonsticky and nonplastic.

Notes: Active groundwater as 46.5 inches. Fluctuating groundwater interpreted to be between 37 to 46 inches.

Soil Series: Unnamed (XXX)

Soil Classification: Sandy, mixed, frigid, Humic Dystroxerepts

Drainage Class: Moderately well

Soil Hydrologic Group: B



Figure 15, Stop 8 soil description site materials.

**Stop 9 (2/26/22)**

- A1 0 to 11 inches, very dark grayish brown (10YR 3/2), moist, fine sand; moderate medium granular structure; soft, loose, nonsticky and nonplastic; many fine and medium roots; many very fine and fine interstitial pores; clear smooth boundary.
- Bw1 11 to 24 inches, brown (10YR 4/3), moist, fine sand; weak fine granular structure; soft, loose, nonsticky and nonplastic; few fine roots; many very fine interstitial pores; gradual smooth boundary.
- Bw2 24 to 36 inches, brown (2.5Y 4/3) with few faint and fine redox concentrations of olive brown (2.5Y 4/6), fine sand; single grain; soft loose, nonsticky and nonplastic; gradual smooth boundary.
- 2Ab1 36 to 49 inches, brown (2.5Y 4/3) dark grayish brown with common medium distinct redoximorphic concentrations of strong brown (7.5YR 4/4) fine sand; single grain; soft, loose, nonsticky and nonplastic; gradual smooth boundary.
- 2Abg 46 to 60 inches, brown (10YR 4/2) with common medium distinct redoximorphic depletions of very dark gray (10YR 5/1), sand; single grain; soft, loose, nonsticky and nonplastic.

Notes: Active groundwater at 46 inches. Fluctuating groundwater interpreted to be between 38 to 46 inches. SEZ based on Primary Indicator, Aspen.

Soil Series: Unnamed (XXX)

Soil Classification: Sandy, mixed, frigid, Oxyaquic Dystroxerepts

Drainage Class: Moderately well

Soil Hydrologic Group: B



Figure 16 - Stop 9 soil materials.

### Stop 10

- A 0 to 22 inches, dark olive brown (2.5Y 3/3), fine sand; single grain; soft, loose, nonsticky and nonplastic; many very fine, fine and medium roots; many fine interstitial pores; gradual smooth boundary.
- C 22 to 36 inches, olive brown (2.5Y 4/3), moist, fine sand; single grain; soft, loose, nonsticky and nonplastic; clear smooth boundary.
- 2 Ab 36 to 44 inches, brown (10YR 4/3), moist, fine sand; single grain; soft, loose, nonsticky and nonplastic; gradual wavy boundary.
- 2C 44 to 60 inches, brown (7.5YR 4/4), moist, fine sand; single grain; soft, loose, nonsticky and nonplastic.

Notes: Groundwater is deep. Buried surface at 36 inches.

Soil Series: Unnamed (XXX)

Soil Classification: Mixed frigid, Typic Xeropsammets.

Soil Drainage Class: Excessive

Hydrologic Soil Group: A



Figure 17 - Stop 10 showing rooted surface.



Figure 18 - Stop 10 showing dark buried surface at 36 inches depth.

#### References:

Adams, K. D., and T. B. Minor 2001. Desert Research Institute, University and Community College System of Nevada. *Historic Shoreline Change at Lake Tahoe from 1938 to 1998: Implications for Water Clarity*. Submitted to TRPA.

Adams, K. D., 2004. *Shorezone Erosion at Lake Tahoe: Historical Aspects, Processes and Stochastic Modeling*. Final Report for the U.S. Bureau of Reclamation and Tahoe Regional Planning Agency; Ch.4. Desert Research Institute.

Bailey, R. G. 1974. USDA Forest Service, prepared in cooperation with the Tahoe Regional Planning Agency. *Land-Capability Classification of the Lake Tahoe Basin, California-Nevada*.

Beta Analytic Radiocarbon Dating Laboratory, 2007. *Radiocarbon Dating Result for Sample LK-80 7/8/07*. Miami, FL.

Glossary of Soil Science Terms (<https://www.soils.org/publications/soils-glossary/#>)

Rogers, et al. 1974. USDA, Soil Conservation Service. *Soil Survey Tahoe Basin Area, California-Nevada*.

Tahoe Regional Planning Agency. Parcel Tracker. *LCV Map APN 117-072-007* TRPA.gov.

Land Capability Challenge, 6674 N. Lake Boulevard, Tahoe Vista, Placer County, California (APN 117-072-007)

Page 23

USDA Natural Resources Conservation Service, *Keys to Soil Taxonomy, Twelfth Edition*, 2014.

USDA Natural Resources Conservation Service, *Soil Survey Handbook, No. 18*, 2017.

USDA Natural Resources Conservation Service, Part 630 Hydrology, National Engineering Handbook, Chapter 7 *Hydrologic Soil Groups*, 2007.

Western Regional Climate Center, 2022,  
[https://wrcc.dri.edu/Climate/comp\\_table\\_show.php?stype=wind\\_dir\\_avg](https://wrcc.dri.edu/Climate/comp_table_show.php?stype=wind_dir_avg)