

MEMORANDUM

Date: December 8, 2016

To: TRPA Hearings Officer

From: TRPA Staff

Subject Alling Trust Land Capability Challenge; 1232 Highway 50, Douglas County, NV;  
Assessor's Parcel No: 1418-34-201-002, TRPA File No: LCAP2016-0389

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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, specifically changing the land capability from Class 2 (42,634 square feet) and Class 4 (45,378 square feet) to Class 4 (35,304 square feet) and Class 6 (52,703 square feet). The western portion of this parcel was previously verified as Class 4 (27,786 square feet) and remains Class 4, and is included in the totals above.

Background: The subject parcel is shown as Class 2 and Class 4 on TRPA Land Capability Overlay Maps (aka Bailey Land Capability maps). The Soil Conservation Service Soil Survey of Tahoe Basin Area, California-Nevada (Rogers, 1974) places the western portion of the parcel in the Cagwin-Rock outcrop complex, 5 to 15 percent slope map unit (CaD). The eastern portion of the parcel is mapped as Cagwin-Rock outcrop complex, 15 to 30 percent slopes (CaE). This parcel has a geomorphic mapping of C1 for Streamcut granitic mountain slopes, granitic foothills (Moderate hazard lands). The Cagwin soils are moderately deep, somewhat excessively drained soils that formed in material weathered from granitic rock. Cagwin soils have loamy coarse sand textures in the A-horizon, with loamy coarse sand or coarse sand subsurface textures in the upper 27 inches. Weathered granitic bedrock is encountered between 20 and 40 inches below ground surface. The updated Soil Survey of Tahoe Basin Area, California and Nevada (NRCS, 2007) this parcel is mapped as mapunit 7422- Cassenai gravelly loamy coarse sand, 15 to 30% slopes, very stony (for entire parcel).

A land capability challenge was filed with TRPA on October 12<sup>th</sup>, 2016. MidKiff and Associates is representing the owner, Alling Trust, and hired Denny Churchill to prepare a land capability analysis. Two soil pits were excavated and described by Mr. Churchill on August 18<sup>th</sup>, 2016. On October 5<sup>th</sup>, TRPA contractor, Phil Scoles examined two confirmatory auger holes near Mr. Churchill's upper and lower soil descriptions.

Findings: Two soil pits were excavated on the parcel. Both pits were situated to the east of the residence and garages, near the center of the parcel. Pit one was lower on the slope, and was hand excavated to 30 inches, and augured to 62 inches. Pit 2 was higher on the slope and was hand excavated to a depth of 25 inches, and augured to 56 inches. The soils at these pits are

very similar. Pit 1 has gravelly coarse sand surface textures, with gravelly loamy coarse sand and very gravelly coarse sand subsurface textures. Pit 2 has gravelly loamy sand surface and subsurface textures, with gravelly coarse sand in the lowest horizon. These soils are both very deep, somewhat excessively drained, and have moderately rapid permeability, placing them in Hydrologic Soil Group A. These soils are classified as Mixed, frigid, Dystric Xeropsamments. Soil notes from Mr. Scoles identified “grus” or highly weathered granitic bedrock at about 48 inches in pit one, and 44 inches in pit 2. Roots penetrate into this weathered material.

These soils are deeper than 20 to 40 inches, so they do not meet the range in characteristics for the Cagwin soil component. They are an unmapped soil (XXX) in the 1974 Soil Survey. These soils meet the range and characteristics of the Cassenai soil component, as mapped in the 2006 Soil Survey.

Slopes on this parcel range from 6 to 18 percent. Placing the soils of the subject parcel within two capability classes based on slope; Class 4 (9 to 30 percent slopes) and Class 6 (0 to 16 percent slopes).

The table below summarizes the changes in land capability as concluded by this land capability challenge.

| <b>Land Capability District</b>                   | <b>Area (sq. ft.)<br/>From 1974 Soil<br/>Survey</b> | <b>Area (sq. ft.)<br/>2016 LCC</b> |
|---|---|------------------------------------|
| Class 2 (30 to 50 % slopes)                       | 42,634  | 0                                  |
| Class 4 (9 to 30 % slopes)<br>Previously verified | 29,786  | 29,786                             |
| Class 4 (9 to 30 % slopes)                        | 15,587  | 5,518                              |
| Class 6 (0 to 16 % slopes)                        | 0   | 52,703                             |
| <b>Total Parcel Area</b>                          | <b>88,007</b>                                       | <b>88,007</b>                      |

This memorandum was jointly prepared by TRPA subcontractor Marchel Munnecke (Pyramid Botanical Consultants) and TRPA Associate Planner, Julie Roll. If you have questions on this Hearings Officer item, please contact Julie Roll, 775-589-5247, or email at [jroll@trpa.org](mailto:jroll@trpa.org).

## BAILEY LAND CAPABILITY CHALLENGE FINDINGS

| <b>Site Information</b>                 |                                    |
|---|------------------------------------|
| <b>Assessor's Parcel Numbers: (APN)</b> | 1418-34-201-002                    |
| <b>TRPA File No. / Submittal Date:</b>  | LCAP2016-0389 / 10/12/2016         |
| <b>Owner or Applicant:</b>              | Alling Trust                       |
| <b>Address:</b>                         | PO Box 1005, Zephyr Cove, NV 89448 |

| <b>Environmental Setting</b>  |   |
|---|---|
| <b>Bailey Soil Mapping Unit<sup>1</sup> / Hydrologic Soil Group (HSG) / Land Class / Geomorphic Hazard Unit</b> | Cagwin-Rock outcrop complex, 5 to 15 % slope map unit (CaD) and Cagwin-Rock outcrop complex, 15 to 30 % slopes (CaE)/ HSG B/ C1 (Streamcut granitic mountain slopes, granitic foothills, moderate hazard lands) |
| <b>Soil Parent Material</b>   | Colluvium over residuum from granitic rock  |
| <b>Slopes and Aspect</b>  | 6 to 18 percent; sloping to the west  |
| <b>Elevation and Datum</b>  | 6229 to 6274 (MidKiff and Associates, assumed datum)  |
| <b>Rock Outcrops and Surface Configuration</b>  | None present  |
| <b>SEZ and Hydrology Source</b>   | None present  |
| <b>Vegetation</b>   | Jeffrey pine, white fir, incense cedar, antelope bitterbrush, and greenleaf manzanita.  |
| <b>Ground Cover Condition</b>   | Good (vegetation 60%, duff/mulch 75% cover)   |
| <b>Site Features</b>  | Residence, two garages, decks, raised path, paved parking, paved driveway, BMP pond, pump house, and stairs.  |

| <b>Field Investigation and Procedures</b>                       |   |
|---|---|
| <b>Consultant and Address</b>                                   | Denny Churchill<br>145 Cottonwood Ct.<br>Quincy, CA 95971                                     |
| <b>TRPA Staff Field Dates</b>                                   | Oct. 5 <sup>th</sup> 2016   |
| <b>SEZ Mapping / NRCS Hydric Soil</b>                           | None present  |
| <b>Number of Soil Pits or Auger Holes and Description Depth</b> | 2 hand excavated pits by Mr. Churchill, and 2 auger observations at these pits by Mr. Scoles. |
| <b>Additional or Repetitive TRPA Sample Locations</b>           | NA  |
| <b>Representative Soil Profile Descriptions</b>                 | Mr. Churchill's land capability report includes two soil profile descriptions.                |
| <b>Areas Not Examined</b>                                       | Area to west of upper garage, and paved driveway were   |

<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.

|  |                                     |
|--|-------------------------------------|
|  | not examined during this challenge. |
|--|-------------------------------------|

| <b>TRPA Findings</b>                                       |   |
|--|---|
| <b>2006 Soil Survey Map Unit</b>                           | 7421- Cassenai gravelly loamy coarse sand, 5 to 15 % slopes, very stony (for entire parcel)   |
| <b>Consultant Soil Mapping Determination and Rationale</b> | XXX- Both soils are very deep, somewhat excessively drained, with moderately rapid permeability, and are in HSG A. These soils fit the range and characteristics of the Cassenai soil component. Based on slopes, these soils place into land capability Class 4 (9-30 % slope) and Class 6 (0-16 % slope). |
| <b>Slope Determination</b>                                 | 6 to 18 percent slopes  |
| <b>TRPA Conclusion(s)</b>                                  | TRPA concurs with consultants' determination and rationale above.   |
| <b>Applicable Area</b>                                     | See map in Mr. Churchill's Land Capability Assessment Report.   |

Attachments:

- A. Site Plan
- B. Land Capability Assessment/Soil Profiles

Attachment A  
Site Plan

Figure 1-1

**Land Capability Assessment For A Portion  
Of  
Douglas APN 1418-34-201-002  
1232 Highway 50, Douglas County, NV**

September 23, 2016

**Land Capability Assessment For**  
Midkiff and Associates, Inc.  
PO Box 12427  
Zephyr Cove, NV

**Land Capability Assessment By**  
Denny M. Churchill  
Consulting Soil Scientist  
CPSS, CPESC  
145 Cottonwood Court  
Quincy, CA 95971

**LEGEND**

- A ASPEN TREE
- A/C ASPHALTIC CONCRETE
- C CEDAR TREE
- CW COTTONWOOD TREE
- DI DRAIN INLET
- F FIR TREE
- J JUNIPER TREE
- L LODGEPOLE PINE
- L/S LANDSCAPE/NATURAL GROUND
- MTBC MARKED TO BE CUT
- P PINE TREE
- SDMH STORM DRAIN MANHOLE
- SSCD SANITARY SEWER CLEANOUT
- SSMH SANITARY SEWER MANHOLE
- TW TRAVELED WAY
- +77.7 SPOT ELEVATION
- EDGE OF PAVEMENT
- CONTROL POINT

**OWNER & MAILING ADDRESS**

RONALD D. ALLING, TTEE  
P.O. BOX 1095  
ZEPHYR COVE, NV 89448

**LAND AREA**

88,867 SQUARE FEET

**COVERAGE W/ 3:1 HEIGHT  
REDUCTION WHERE APPLICABLE**

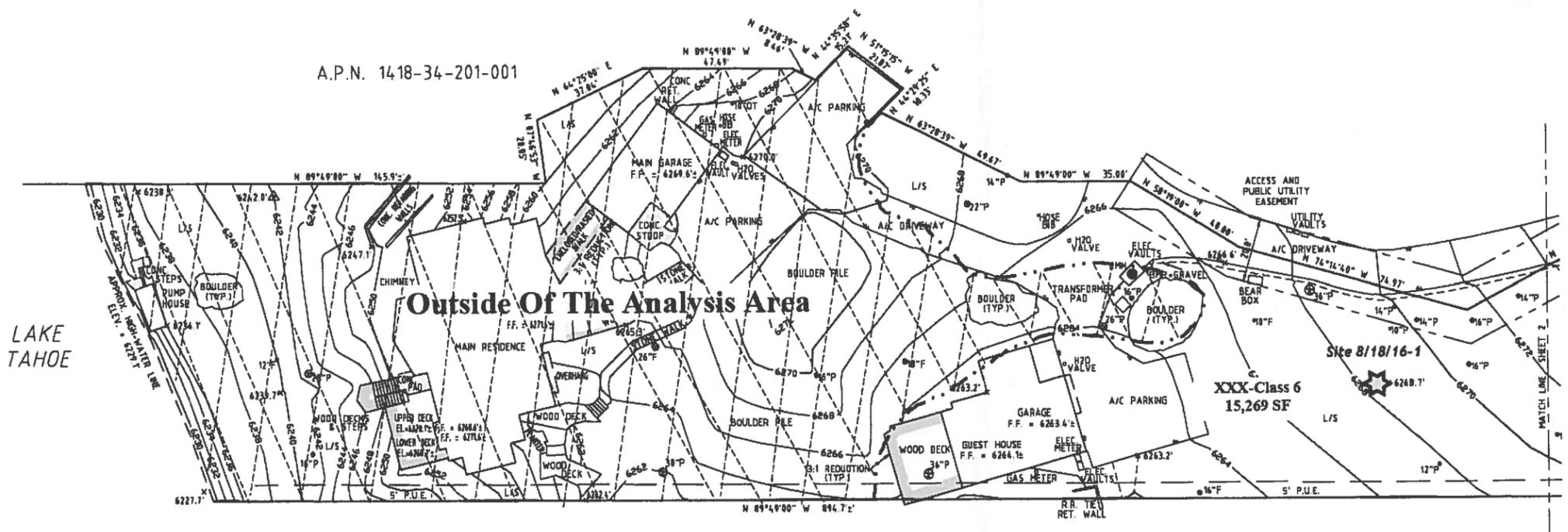
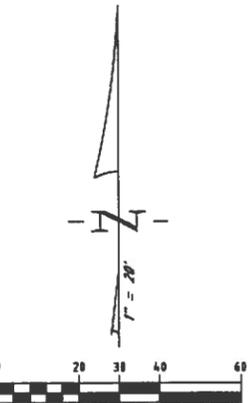
| CATEGORY                 | SQUARE FEET   |
|--------------------------|---------------|
| MAIN RESIDENCE           | 3019          |
| RASSED/COVERED WALK      | 133           |
| MAIN GARAGE              | 862           |
| WOOD WALKS/DECKS/STEPS   | 1,192         |
| CONCRETE PAD/STOOP/STEPS | 724           |
| PUMP HOUSE               | 79            |
| STONE PATHS              | 231           |
| GUEST HOUSE/GARAGE       | 1247          |
| A/C DRIVEWAY/PARKING     | 5439          |
| <b>TOTAL</b>             | <b>12,538</b> |

**ESTIMATED OFFSITE COVERAGE**

| CATEGORY     | SQUARE FEET |
|--------------|-------------|
| A/C DRIVEWAY | 152         |
| <b>TOTAL</b> | <b>152</b>  |

**COVERAGE WITHIN ACCESS AND P.U.D. EASEMENT**

| CATEGORY     | SQUARE FEET  |
|--------------|--------------|
| A/C DRIVEWAY | 3016         |
| <b>TOTAL</b> | <b>3,016</b> |



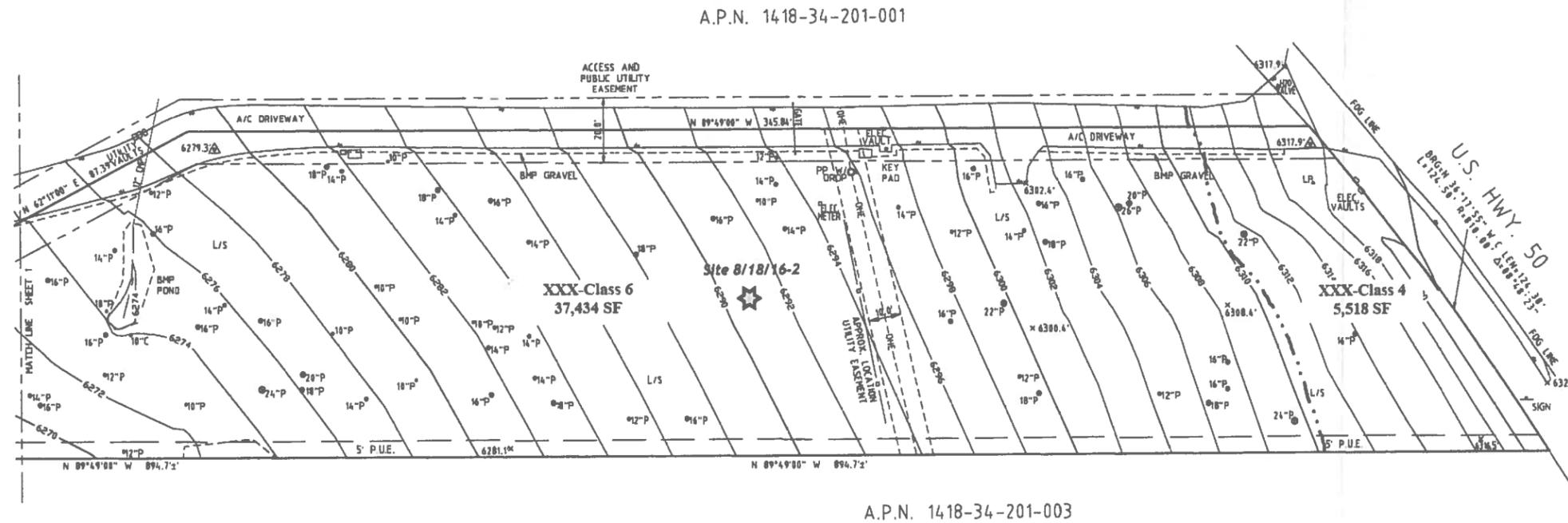
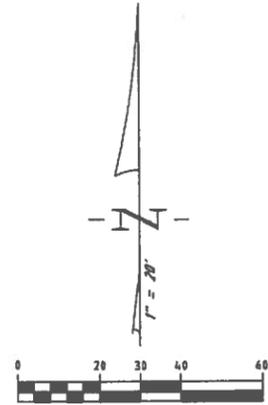
**NOTES**

- THE PROPERTY LINE INFORMATION SHOWN HEREON IS FROM RECORD DATA AND DOES NOT REPRESENT A BOUNDARY SURVEY.
- THIS SURVEY HAS BEEN PREPARED WITHOUT USE OF A TITLE REPORT UNLESS REFERENCED HEREON.
- TURNER AND ASSOCIATES INC. ASSUMES NO RESPONSIBILITY FOR ANY EASEMENTS WHICH MAY AFFECT THIS PROPERTY
- PROPERTY OWNER AND/OR DESIGNER MUST VERIFY BUILDING SETBACKS AND ANY OTHER BUILDING RESTRICTIONS BEFORE ANY DESIGN OR CONSTRUCTION.
- ONLY VISIBLE UTILITIES AND FEATURES HAVE BEEN LOCATED.
- THIS DRAWING OR MAP IS THE PROPERTY OF TURNER & ASSOCIATES INC., AND MAY NOT BE USED OR REPRODUCED WITHOUT THE CONSENT OF TURNER & ASSOCIATES INC.

**TURNER & ASSOCIATES, INC.**  
LAND SURVEYING  
(775) 588-5658  
FAX (775) 588-9296  
308 DORLA COURT, SUITE 203 - ROUND HILL, NEVADA 89448  
P.O. BOX 5867 - STATELINE, NEVADA 89449

|   |             |  |  |  |  |          |
|---|-------------|--|--|--|--|----------|
| <b>BENCH MARK</b>                       |             | <b>TOPOGRAPHIC SURVEY</b><br>PARCEL PER DOC. NO. 0739479<br>APN 1418-34-201-002, 1232 HWY. 50<br>DOUGLAS CO., NV |  |  |  | DATE     |
| NUMBER                                  | 100.00'     |  |  |  |  | AUG 2014 |
| ELEVATION                               | ASSUMED     | SHEET  |  |  |  |          |
| DATUM                                   | SET MAG HUB | 1  |  |  |  |          |
| DESCRIPTION                             | IN DIRT     | OF   |  |  |  |          |
|   |             | 2  |  |  |  |          |
| SCALE      HORIZ 1"=20'      VERT 2"=1' |             | FILE NAME  |  |  |  |          |
|   |             | 14140 DWG  |  |  |  |          |
| REVISION NO.                            | DATE        | CHECKED  |  |  |  |          |
|   |             | JMT  |  |  |  |          |
|   |             | BY   |  |  |  |          |
|   |             | CHKD   |  |  |  |          |
| <b>AGENDA ITEM NO. V.A.</b>             |             |  |  |  |  |          |

Figure 1-2



**LEGEND**

|       |                          |
|-------|--------------------------|
| A/C   | ASPHALTIC CONCRETE       |
| C     | CEDAR TREE               |
| CW    | COTTONWOOD TREE          |
| L/S   | LANDSCAPE/NATURAL GROUND |
| P     | PINE TREE                |
| ±77.7 | SPOT ELEVATION           |
| ---   | EDGE OF PAVEMENT         |
| △     | CONTROL POINT            |

**NOTES**

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 FAX (775) 588-9296  
 300 DORLA COURT, SUITE 203 - ROUND HILL, NEVADA 89448  
 P.O. BOX 5067 - STATELINE, NEVADA 89449

|   |  |  |                      |                    |                      |                              |                           |                    |                 |                      |                     |
|---|--|--|----------------------|--------------------|----------------------|------------------------------|---------------------------|--------------------|-----------------|----------------------|---------------------|
| <p><b>BENCH MARK</b></p> <p>NUMBER _____</p> <p>ELEVATION 100.00'</p> <p>DATUM ASSUMED</p> <p>DESCRIPTION SET MAG HUB<br/>IN DIRT</p> |  | <p>TOPOGRAPHIC SURVEY<br/>                 PARCEL PER DOC. NO. 0739479<br/>                 APN 1418-34-201-002, 1232 HWY. 50<br/>                 DOUGLAS CO., NV</p> |                      |                    |                      | <p>DATE<br/>AUG<br/>2014</p> |                           |                    |                 |                      |                     |
| <p>REVISION NO. _____</p> <p>DATE _____</p> <p>DESCRIPTION _____</p>  |  | <p>SCALE _____</p>   | <p>HORIZ. 1"=20'</p> | <p>VERT. 2"=1'</p> | <p>FIELD SW - JR</p> | <p>DRAWN SW</p>              | <p>FILE NAME 1418 DWG</p> | <p>CHECKED JMT</p> | <p>BY _____</p> | <p>JOB NO. 14149</p> | <p>SHEET 2 OF 2</p> |
| <p><b>AGENDA ITEM NO. V.A.</b></p>  |  |  |                      |                    |                      |                              |                           |                    |                 |                      |                     |

Attachment B  
Land Capability Assessment/Soil Profiles

**Land Capability Assessment  
For  
Douglas Parcel APN 1418-34-201-002**

**September 23, 2016**

RECEIVED

OCT 12 2016

TAHOE REGIONAL  
PLANNING AGENCY

**INTRODUCTION**

A soil investigation was conducted by Denny M. Churchill, Consulting Soil Scientist on Douglas County Parcel APN 1418-34-201-002 on August 18, 2016. The objective of the study was 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 of impervious coverage regulation, as defined in Chapter 30 of the Code of Ordinances.

The parcel supports a single-family dwelling in a mixed residential setting on approximately 2.09 acres of land located at 1232 Highway 50, Douglas County, NV. This work is advanced at the request of Mr. Gary Midkiff, principle of Midkiff and Associates, Inc., agents for Mr. Ron Alling.

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 or seismic analysis.

**ENVIRONMENTAL SETTING**

The parcel is located at T14N R18E, W/2 of section 34. Vegetation consists of Type 17-Mixed conifer and composed of Jefferey pine, white fir, bitter brush, rabbit brush, greenleaf manzanita, squaw carpet, snow brush and mixed grasses. There are no stream environment zones (SEZ) influencing this parcel.

Soils are shown on the TRPA GIS Data Base (<http://gis.trpa.org/datadownloader/>) as CaD-Cagwin-Rock outcrop complex, 5 to 15 percent slopes, and CaE-Cagwin-Rock outcrop complex, 15 to 30 percent slopes. Geology (Grose, 1985) is characterized as Keg-Granodiorites. Bailey's geomorphic analysis (1974) shows the parcel as E2-Outwash, till, and lake deposits (low hazard lands).

**METHODOLOGY**

The parcel was surveyed based on slope delineations and landscape position. Two sites considered representative of the landform were chosen and excavations were placed 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. 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 map was available (Turner and Associates, Inc., 8/2014) for site location and slope control. Information pertaining to land capability districts is shown on Figure 1.

## FINDINGS

Referring to Figures 1-1 and 1-2 attached site maps, soils at site 8/18/16-1 are found to be deep, somewhat excessively drained, and members of Soil Hydrologic Group A. They can be characterized as having brown or yellowish brown gravelly loamy coarse sand top soil approximately 16 inches thick, over a brown gravelly loamy coarse sand subsoil to a depth of 62 inches. Vegetation at this site is Type 17-Mixed conifer. Soils were dry throughout at the time of excavation. Soils at this location are deeper than 40 inches, placing them outside the range of characteristics for Cagwin loamy coarse sand.

Soils at site 8/18/16-2 are found to be deep, somewhat excessively drained, and members of Soil Hydrologic Group A. They can be characterized as having brown or dark grayish brown gravelly loamy coarse sand top soil approximately 16 inches thick, over a brown or yellowish brown gravelly loamy coarse sand subsoil to a depth of 60+ inches. Vegetation at this site is representative of Type 17- Mixed conifer. Soils were dry throughout at the time of excavation. Soils at this location are deeper than 40 inches, placing them outside the range of characteristics for Cagwin loamy coarse sand.

## CONCLUSIONS AND RECOMMENDATIONS

Soils found at site 8/18/16-1 are deeper than the Cagwin loamy coarse sand soils presently mapped at this site, are considered unmapped inclusions within the CaD map unit, and place in land capability class 6.

Soils found at site 8/18/16-2 are deeper than the Cagwin loamy coarse sand soils presently mapped at this site, are considered unmapped inclusions within the CaE map unit, and place in land capability class 6.

Please refer to the following soil profile descriptions that support the findings and the attached maps (Figures 1-1 and 1-2) showing the spatial distribution of the appropriate land capability classes on the parcel.

Respectfully submitted,



Denny M. Churchill  
Certified Professional Soil Scientist No. 0755

## Representative Soil Profile Descriptions

Site 8/18/16-1: Excavated pit to 30 inches, auger to 62 inches.

Location: 39° 02' 04.40" N. Latitude; 119° 56' 57.32" W. Longitude (WG84 datum)

Elevation: 6268 feet (from Turner and Assoc., 8/2014)

Landform: Out sloped terrace (slopes to the south west).

Vegetation: Jeffery pine, white fir, bitter brush and greenleaf manzanita.

- Oi 0 to 2 inches, pine needles, duff and root mass.
- A1 2 to 4 inches, brown (10YR 5/3) gravelly coarse sand, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine to medium and few coarse roots throughout; common fine interstitial pores; 25 percent small subangular gravels; slightly acid (pH 6.2); clear wavy boundary.
- A2 4 to 16 inches, yellowish brown (10YR 5/4) gravelly coarse sand, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine to medium and few coarse roots throughout; common fine interstitial pores; 30 percent small subangular gravels; slightly acid (pH 6.2); clear wavy boundary.
- Bw1 16 to 55 inches, brown (10YR 4/3) gravelly loamy coarse sand, dark brown (10YR 3/3) moist; moderate fine to medium granular structure grading to massive; loose, loose, nonsticky and nonplastic; few to common fine to medium and few coarse roots; many fine interstitial pores; 25 percent small subangular gravels; slightly acid (pH 6.2); clear wavy boundary.
- C1 55 to 62 inches, light olive brown (2.5Y 5/4) very gravelly coarse sand, dark olive brown (2.5Y 3/3) moist; massive to single grained; loose, loose, nonsticky and nonplastic; few fine roots; many fine interstitial pores; 40 percent small subangular gravels; moderately acid (pH 6.0); clear wavy boundary. (Refusal at 62 inches due to stones and gravels).

Parent material: Colluvium over residuum weathered from granodiorite.

Drainage class: Somewhat excessively drained. Moderately rapid permeability.

Slope: 8-10 percent sloping south 40 degrees west.

1974 soil series: None. Deeper than Toem or Cagwin soils.

2003 soil series: Cassenai gravelly loamy coarse sand.

Soil classification: Mixed, frigid Dystric Xeropsamments

Hydrologic Soil Group: A

Soil was dry throughout at the time of excavation.

Site 8/18/16-2: Excavated pit to 25 inches, auger to 56 inches.

Location: 39° 02' 04.44" N. Latitude; 119° 56' 53.70" W. Longitude (WG84 datum)

Elevation: 6290 feet (from Turner and Assoc., 8/2014)

Landform: Out sloped terrace (slopes to the south west).

Vegetation: Jeffery pine, white fir, bitter brush, snow brush, squaw carpet and mixed grasses.

Oi 0 to 2 inches, pine needles, duff and leaves.

A1 2 to 6 inches, brown (10YR 4/3) gravelly loamy coarse sand, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common to many very fine to medium and few coarse roots throughout; common fine interstitial pores; 15 percent small subangular gravels; slightly acid (pH 6.2); clear wavy boundary.

A2 6 to 16 inches, dark yellowish brown (10YR 4/4) gravelly loamy coarse sand, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine to medium and few coarse roots throughout; common fine interstitial pores; 15 percent small subangular gravels; slightly acid (pH 6.2); clear wavy boundary.

Bw1 16 to 45 inches, yellowish brown (10YR 5/4) gravelly loamy coarse sand, dark brown (10YR 3/3) moist; moderate fine to medium granular structure grading to massive; loose, loose, nonsticky and nonplastic; many fine to medium and few coarse roots; many fine interstitial pores; 25 percent small subangular gravels; moderately acid (pH 6.0); clear wavy boundary.

C1 45 to 56 inches, yellowish brown (10YR 5/4) gravelly coarse sand, dark yellowish brown (10YR 3/4) moist; massive to single grained; loose, loose, nonsticky and nonplastic; few fine to medium roots; many fine interstitial pores; 25 percent small subangular gravels; moderately acid (pH 6.0); clear wavy boundary.  
(Refusal at 56 inches due to stones and gravels).

Parent material: Colluvium over residuum weathered from granodiorite.

Drainage class: Somewhat excessively drained. Moderately rapid permeability.

Slope: 10-14 percent sloping south 45 degrees west.

1974 soil series: None. Deeper than Toem or Cagwin soils.

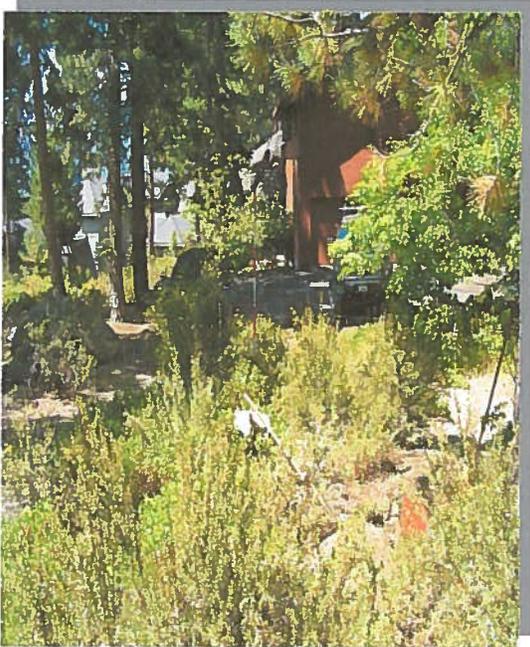
2003 soil series: Cassenai gravelly loamy coarse sand.

Soil classification: Mixed, frigid Dystric Xeropsamments

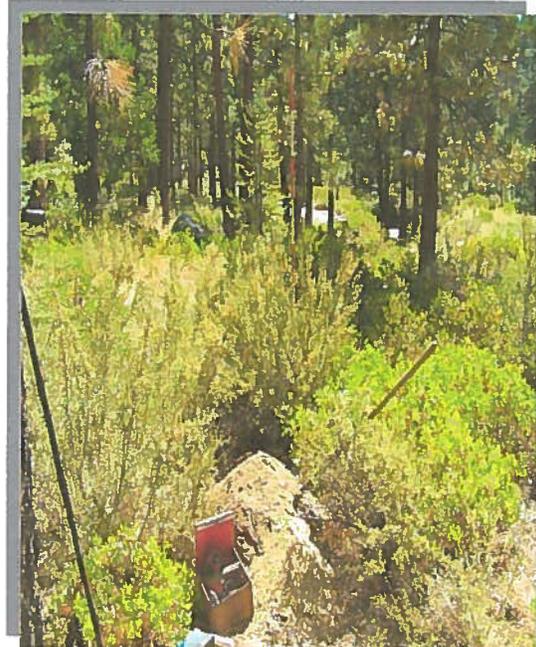
Hydrologic Soil Group: A

Soil was dry throughout at the time of excavation.

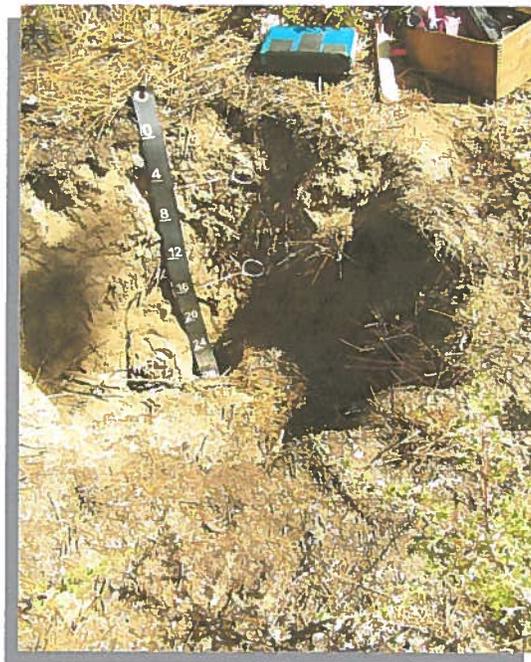
**Site 8/18/16-1**



***Down Slope Towards Residence***

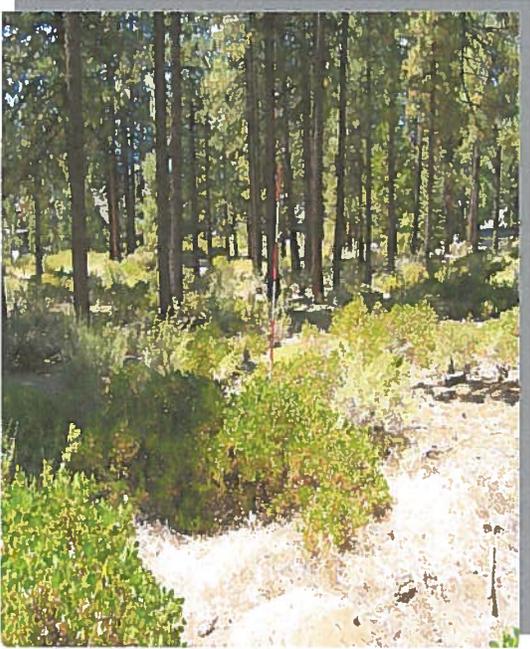


***Up Slope Towards Highway 50***

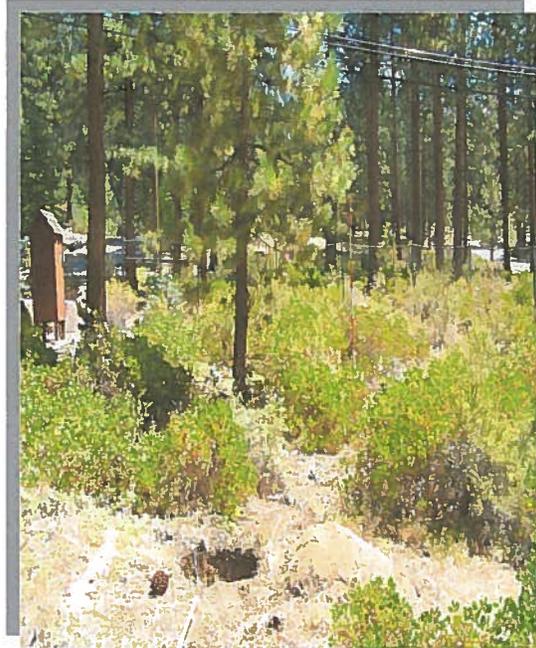


***Representative Soil Profile***

**Site 8/18/16-2**



***Down Slope Towards Residence***



***Up Slope Looking Towards highway 50***



***Representative Soil Profile***