GSH

February 10, 2016
Job No. 2063-01N-16

Mr. Richard Zollinger
2379 Sheffield Drive.
Livermore, California, 94550

Attn: Mr. Zollinger

Re: Work Plan
Geotechnical/Geological Study
Lot 43 Summit at Ski Lake No. 11
Weber County, Utah
(Parts of Section 24, Township 6 North, Range 1 East, Salt Lake base and meridian)

Introduction

The Summit at Ski Lake No. 11 Subdivision is located in the vicinity of Huntsville Town, Weber County, Utah (41.2429, -111.7884). The general Ski Lake development area is located on the south side of Utah SR-39 between MP-16.6 and -17.4, and entirely within Section 24, T6N-R1E SLBM. The Summit at Ski Lake Phase 11 consists of four residential development lots roughly one-acre or greater in area, comprising a total area of approximately 5.7 acres as shown on Figure 1, Site Vicinity Map. Previous phases of the Summit at Ski Lake development are established on the north and generally down slope of the Phase 11 parcel. The Via Cortina access roadway loops around the lot 43 as shown on Figure 2, thus allowing frontage on either the north or south sides of the property. Elevation rises approximately 70 feet from the north side of the lot to the south side of the lot. The recorded address for Lot 43 is 6785 East Via Cortina, and it is listed as comprising 1.17 acres. Architectural drawings prepared by Creative Line LLC. (2015) show plans for an approximately 2,900 square-foot structural footprint for a residence on the south, upslope side, of the property as Shown on Figure 2. The Creative Line LLC drawings indicate the structure is to include a partial basement, and the lower level will daylight on the north, down-slope, side of the structure. The general area of the Phase 11 development includes slopes on the order of 20-pecent to 32-percent.

Because Lot 43 is located on a sloping hill side area with susceptible expansive soil and rock conditions, Weber County has requested that additional geotechnical and geological studies be conducted to evaluate conformance with development plans.

Weber County Natural Hazards Overlay Districts

At this time specific guidelines for these studies have not been specified by the County, however Weber County Chapter 27 Natural Hazards Overlay Districts, Section 27-2B

(Weber County Code, 2015), pertaining to Landslide/Tectonic Subsidence provides the following requirements:

> *...any development proposed within a designated landslide hazard area, as delineated on the Sensitive Lands Overlay District maps, shall require the submittal, review and approval by the Planning Commission, of specific site studies, including grading plans, cut/fill, and plans produced by a qualified engineering geologist and a Utah licensed Geotechnical Engineer. The site specific study shall address slope stability (including natural or proposed cut slopes), evaluate slope-failure potential, effects of development and recommendations for mitigative measures. Slope stability analysis shall include potential for movement under static, development-induced and earthquake-induced conditions as well as likely ground water conditions.*

Sensitive Lands Overlay District maps addressing Landslide/Tectonic Subsidence zones for Weber County are not available for the site. A preliminary review of site geological mapping prepared by Utah Geological Survey (UGS) geologists (King, et al, 2008), has indicated the Lot 43 site to not be within mapped "landslide deposits", but within areas mapped as Tertiary age Norwood Tuff (Tn) formation rocks, which are considered a geological unit of concern by the Weber County Staff. Mapping by King et al, (2008) is presented on Figure 3, Site Geology. The Weber County Hillside Development Review Procedures and Standards Chapter 14, applies development restrictions on property with slopes greater than 25-percent, where *...Lot area and widths shall be increased as the lot or parcel slope percentage increases.*

To assess the adequacy of our proposed geotechnical and geological studies, this Work Plan of our proposed studies must first be submitted and approved by Weber County Staff. Approval of the proposed Work Plan scope requires meetings and discussions with Weber County Staff. The purpose of the scoping meeting is paraphrased below:

> *Scoping Meeting: The developer or consultant should schedule a scoping meeting with the Weber County to evaluate the engineering geologist's/geotechnical engineer's investigative approach. At this meeting, the consultant should present a work plan that includes locations of anticipated geologic hazards and locations of proposed exploratory excavations, such as trenches, borings, CPT soundings, etc., which meet the minimum standard of practice. The investigation approach should allow for flexibility due to unexpected site conditions. Field findings may require modifications to the work plan*

Provisional Work Plan

Pending any scoping meeting amendments, GSH proposes to conduct Geotechnical/Geological Study to include; 1) Work Plan and scope of work development and plan implementation and meetings with Weber County Staff, 2) a search and review

of previous relevant documentation of site engineering and geologic studies and including UGS mapping (King, et al, 2008), and reports and studies prepared by our staff and others (GSH Geotechnical Inc., 2015; Applied GeoTech, 2013; KPS and Associates, Inc., 2001); 3) a field reconnaissance study including the geologic/geotechnical logging and geotechnical sampling of a single walk-in test pit (trench) approximately 75 feet in length and as much as 14 feet in depth and the geotechnical logging and sampling of 3 pits to a depth of as much as 20 feet as shown on Figure 2, 4) site specific geological mapping and classification to identify critical geological units and exposure to proposed site improvements, 5) slope analysis from LiDAR DEM geoprocessing identifying critical areas 30-percent or greater across the site and/or surficial features potentially affecting the proposed site improvements, 6) A laboratory geotechnical soils testing program of samples recovered from the test pits and trenches for typical and critical geological units explored and identified in our subsurface evaluation. Laboratory testing program to include but not be limited to the moisture, density, gradation, Atterberg limits, consolidation, vane shear, and direct shear tests of representative soil samples, and 7) preparation of summary report presenting results of our analysis and findings including:

- A vicinity map showing the location of the property relative to site vicinity and topographic features.
- A geologic map showing the site specific surficial geology of the property and surrounding area.
- Aerial photography showing the site and nearby surficial geologic features.
- Logs of test pits and trenches.
- An assessment of potential geologic hazards in the vicinity of the site and the exposure of the site and proposed site improvements to hazards named in the ordinance including but not limited to: landsliding and slope stability; alluvial fan processes including debris-flow; surface fault rupture hazards, strong earthquake ground motion, and liquefaction hazards; rockfall and avalanche hazards, and flood hazards.
- Cross-section of slope depicting encountered geological conditions.
- Site development recommendations based upon our findings and professional experience.
- Following completion of the geologic study, a geotechnical study will be prepared for the subject property based on the findings of the geologic study and concurrent/subsequent geotechnical evaluations.

For this effort GSH has selected the following Utah licensed professionals to implement and complete the scope for the geotechnical and geological studies discussed herein:

Gregory Schlenker PhD, P.G., Senior Geologist
Andrew Harris P.E., Senior Geotechnical Engineer
Michael Huber, P.E., Senior Geotechnical Engineer

References

Applied GeoTech, 2013, Geotechnical Investigation, Proposed Summit at Ski Lake Phases 12 and 13, Weber County Utah: Unpublished consultants report, 18p., plates.

Creative Line LLC, 2015, Residence for Rich and Lezlie Zollinger, Architectural plans, Unpublished architectural drawings 15 plates.

GSH Geotechnical Inc., 2015, Geological Study, Proposed Via Cortina Access Roadway Extension, The Summit at Ski Lake Phase 13, Weber County, Utah: Unpublished consultants report, 12p., plates.

King, J.K., Yonkee, W.A., and Coogan, J.C., 2008, Interim geologic map of the Snow Basin and part of the Huntsville quadrangle, Davis, Morgan, and Weber Counties, Utah: Utah Geological Survey Open-File Report 536, scale 1:24,000. (hyperlink http://geology.utah.gov/maps/geomap/7_5/pdf/ofr-536.pdf).

KPS and Associates, Inc., 2001, GeoTechnical Investigation, proposed Water Tank Site at Ski Lake Resort, Huntsville, Utah; Unpublished consultants report, 11p. plates.

Weber County Code (2015), retrieved from:
https://www.municode.com/library/ut/weber_county/codes/code_of_ordinances?nodeId=PTIILAUSCO_TIT104ZO_CH27NAHAOVDI#!

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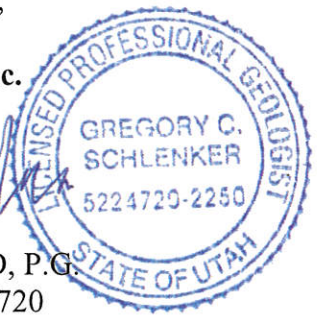
We appreciate the opportunity to prepare this work plan and look forward to meeting with you and Weber County Staff to finalize this plan and commence the appropriate studies to move your project toward completion. If there are any questions regarding this work plan and scope herein, please do not hesitate to contact our office at (801) 393-2012.

Respectfully submitted,

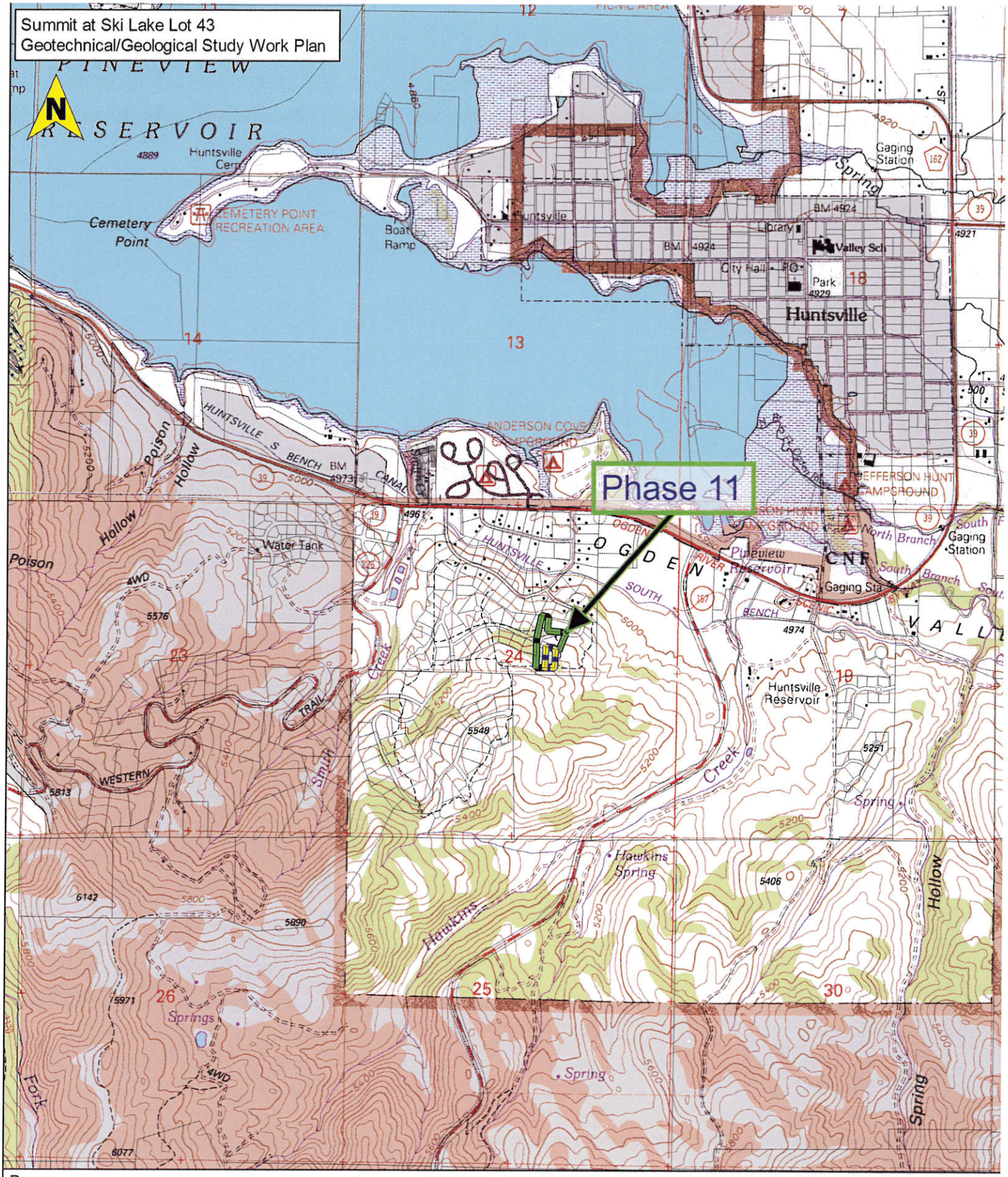
GSH Geotechnical, Inc.



Gregory Schlenker PhD, P.G.
State of Utah No. 5224720
Senior Geologist

Reviewed by:

Andrew M. Harris, P.E.
State of Utah No. 7420456
Senior Geotechnical Engineer



Base:
1998 7.5 Minute USGS Toporgraphic Maps Titled
Snowbasin, Utah, and Huntsville, Utah.

0 1000 2000 3000 4000 ft

1:24,000

FIGURE 1
VICINITY MAP

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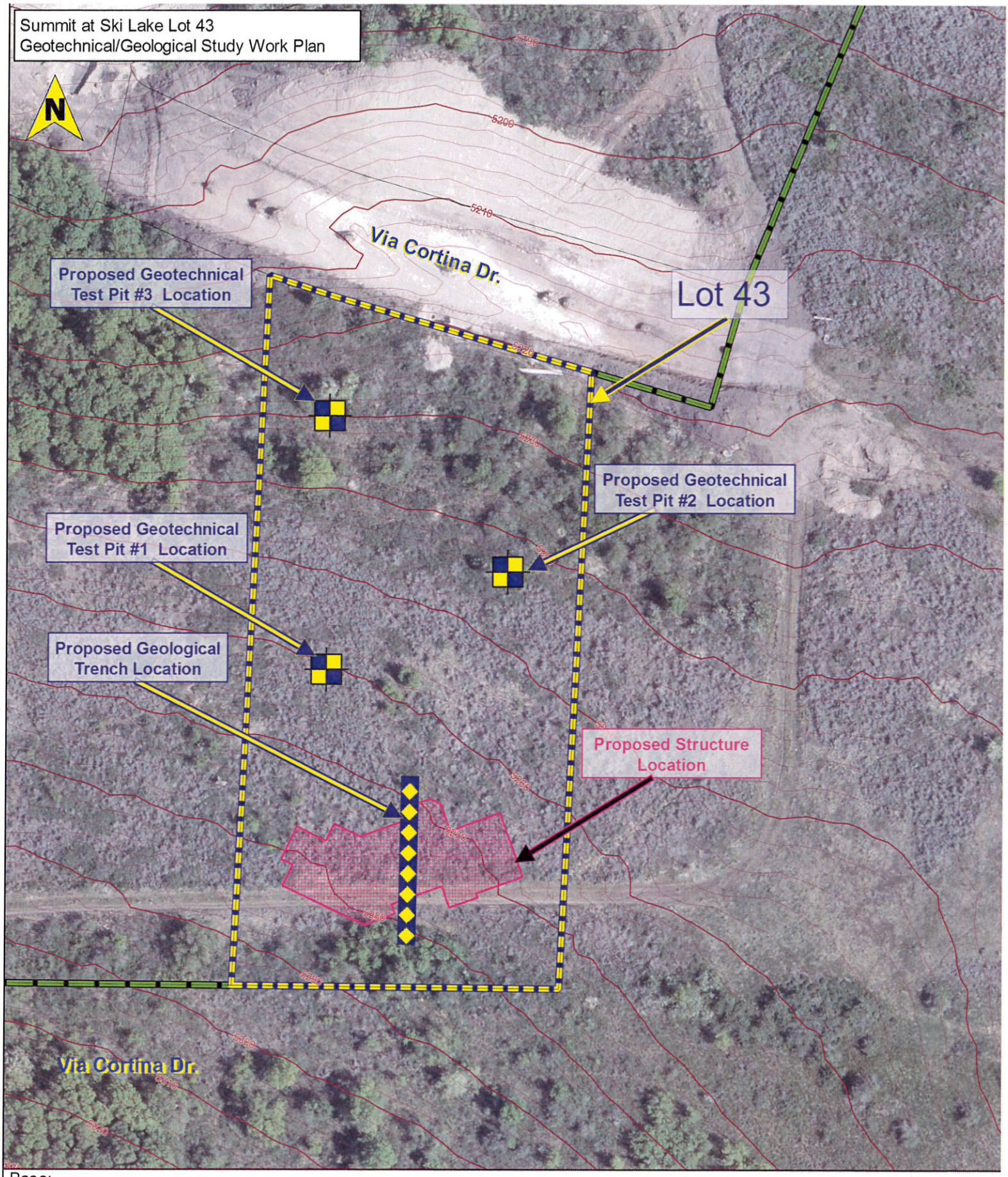

Base:
2012 0.5ft Color HRO Orthoimagery,
from Utah AGRC. http://gis.utah.gov/

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1:720

FIGURE 2
SITE PLAN

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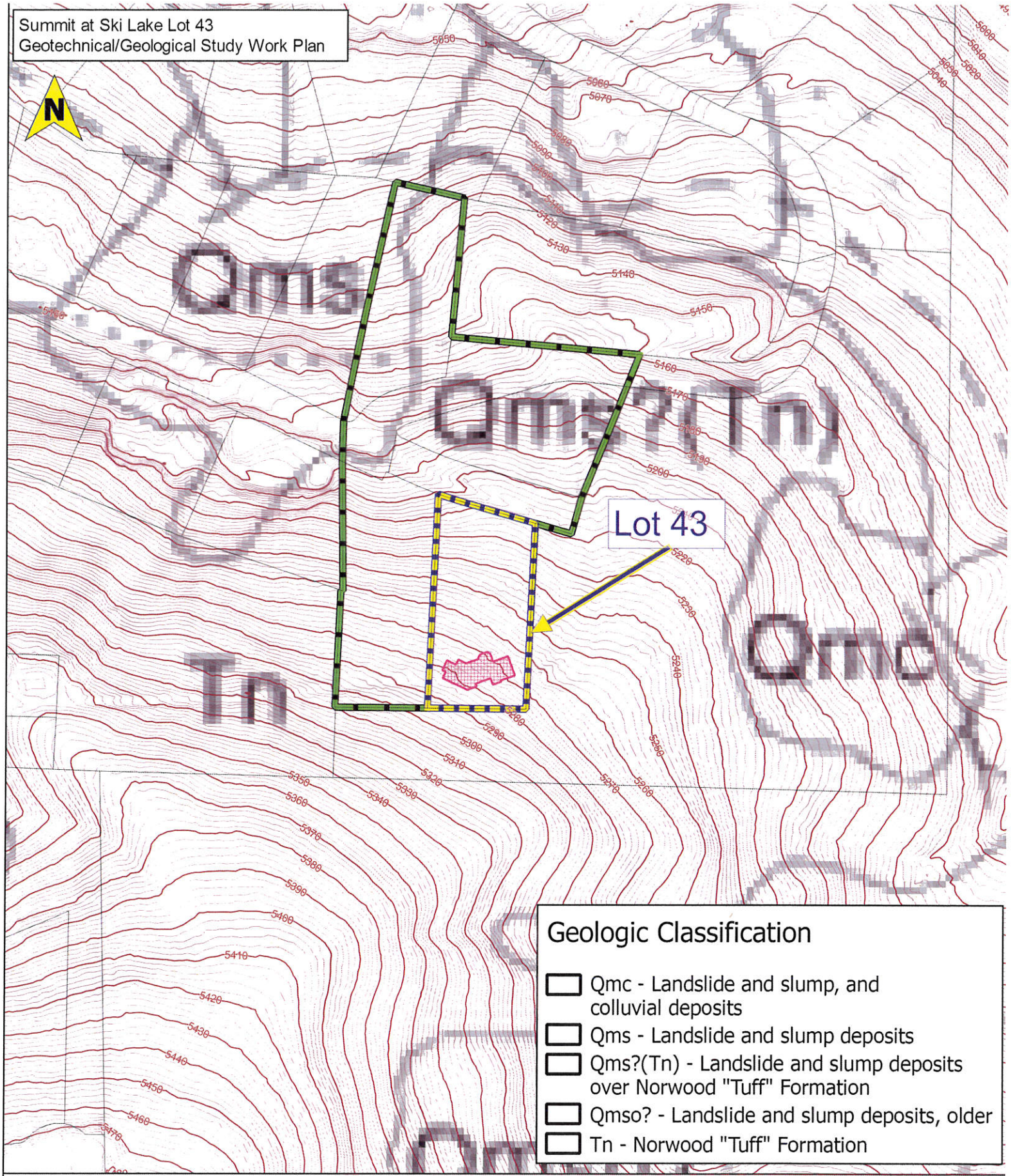

Geology: King, J.K., Yonkee, W.A., and Coogan, J.C., 2008, Interim geologic map of the Snow Basin and part of the Huntsville quadrangle, Davis, Morgan, and Weber Counties, Utah: Utah Geological Survey Open-File Report 536, scale 1:24,000.

FIGURE 3
SITE GEOLOGY

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