

May 2, 2016
Job No. 2129-01N-16

Mr. Vic Holtreman
1172 East Benchview Drive
Ogden, Utah 84404

Attn: Mr. Holtreman

Re: Work Plan
Geotechnical/Geological Study
Lots 22 and 23 The Legends at Hawkins Creek
Huntsville Area, Weber County, Utah
(Parts of the SW 1/4 Section 24, Township 6 North, Range 1 East, Salt Lake base and meridian)

Introduction

The Legends at Hawkins Creek Subdivision is located in the vicinity of Huntsville Town, Weber County, Utah (41.22369, -111.7929). The subdivision is a gated cluster community located on the east side of Old Snowbasin Road approximately 0.6 miles south from Utah SR-39 intersection as shown on Figure 1, Vicinity Map. The subdivision consists of forty-one residential development lots roughly one to two acres in area, and covers a total area of approximately 165 acres. Approximately 40-percent of the subdivision area is dedicated to common area. The two lots to be investigated as part of this Work Plan include Lot 22 and Lot 23. The two properties are adjacent and are located on the east side of Chaparral Road, which is a primary access road that loops through the subdivision as shown on Figure 2, Aerial Coverage. Lot 22 is recorded at 6585 East Chaparral Road, and Lot 23 is recorded at 6564 East Chaparral Road.

The present plans for the development of the two lots calls for the construction of a single residential structure to be located on parts of both lots. The proposed location (footprint) for the structure is shown on Figure 2. The footprint for the proposed structure is approximately 5,000 square feet. Although design has not been finalized for this project we expect the proposed structure to consist of reinforced concrete footings and basement foundation walls supporting 1 to 3 wood-framed levels above grade with some stone, brick, or stucco veneer, with maximum column and wall loads projected to be on the order of 10 to 20 kips and 1 to 3 kips per lineal foot, respectively.

Because the lots are located on a sloping hill side area with susceptible expansive soil and rock conditions (Mulvey, 1992), and partially occupy slopes identified as having "Landslide Potential" (Elliott and Harty, 2010), Weber County (Planning Department) is requesting that additional geotechnical and geological studies be conducted to evaluate

conformance of the proposed development with *Sensitive Lands Overlay District* requirement provisions.

At this time specific guidelines for these studies have not specified by the County, however Weber County Chapter 38 Natural Hazards Overlay Districts, Section 38-2B pertaining to Landslide/Tectonic Subsidence provides the following specification:

...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.

A preliminary review of site geological mapping prepared by Utah Geological Survey (UGS) geologists (King, et al, 2008), has indicated the two lots are partially within mapped "landslide and slump deposits" (Qms), but also within areas mapped as Tertiary age Norwood Formation (Tn) 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 36, 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 to 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

Pending the scoping meeting amendments, GSH proposes to conduct Geotechnical/Geological Studies 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 others (Earthtec Testing & Engineering, 1999); 3) a field reconnaissance study including the geologic logging of a single walk-in trench approximately 250 feet in length and as much as 14 feet in depth, three walk-in test pits to as much as 19 feet in depth, and two geotechnical borings to penetrate as deep as 50 feet, at locations shown on Figure 4, Site Plan; 4) development of a geological cross section along slope section line A-A' shown on Figure 4 to be used for geotechnical engineering slope stability analysis; 5) site specific geological mapping and classification to identify critical geological units and exposure to proposed site improvements; 6) slope analysis from LiDAR DEM geoprocessing identifying critical areas 25-percent or greater across the site and/or surficial features potentially affecting the proposed site improvements; 7) a laboratory geotechnical soils testing program of samples recovered from the test pits, trenches and borings 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 trenches, test pits and borings.
- 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 recommendations for site specific slope stability analysis; alluvial fan processes including debris-flow; surface fault rupture hazards, strong earthquake ground motion, and liquefaction hazards; rockfall and avalanche hazards, flood hazards, and radon
- Cross-sections of slopes 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

Earthtec Testing & Engineering, 1999, Geotechnical Study, Moose Mountain Subdivision, Snow Basin Road, Huntsville, Utah: Unpublished consultants report, 16 p., plates.

Elliott, A.H., and Harty, K.M., 2010, Landslide Maps of Utah, Utah Geological Survey Map 246DM, 14 p., 46 plates, 1:100,000 scale, DVD.

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).

Mulvey, W.E., 1992, Soil and rock causing engineering geologic problems in Utah: Utah Geological Survey Special Study 80, 23 p., scale 1:500,000.

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



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.

A handwritten signature in blue ink that reads "Gregory C. Schlenker".

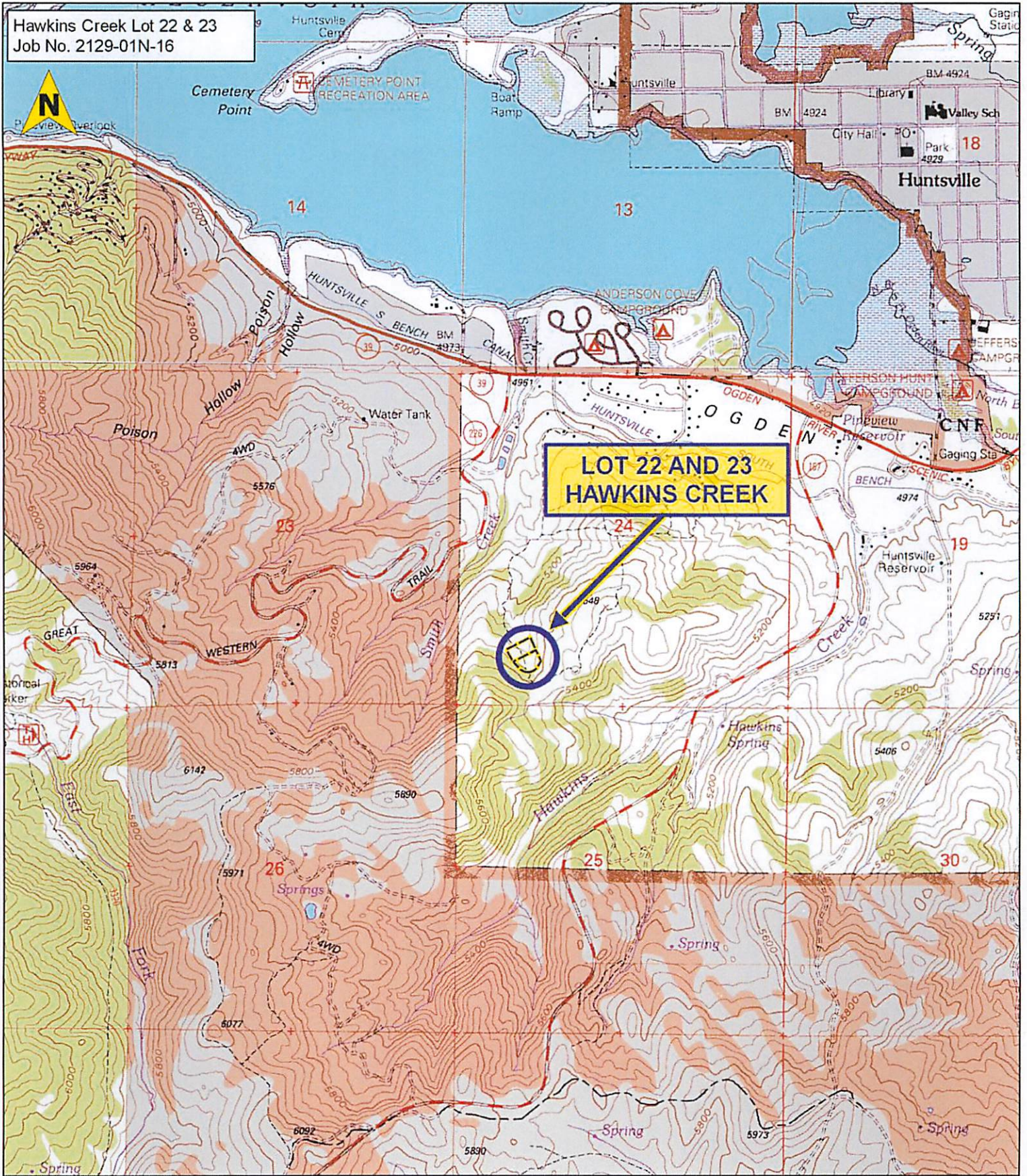
Gregory Schlenker PhD, P.G.
State of Utah No. 5224720
Senior Geologist

Reviewed by

A handwritten signature in blue ink that reads "Andrew M. Harris".

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

Hawkins Creek Lot 22 & 23
Job No. 2129-01N-16



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

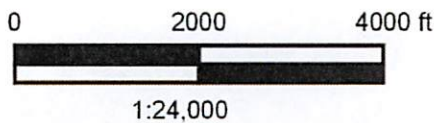


FIGURE 1
VICINITY MAP



Hawkins Creek Lot 22 & 23
Job No. 2129-01N-16



LEGENDS AT
HAWKINS CREEK
SUBDIVISION

Old Snow Basin Rd

Chaparral Rd

LOT 22 AND 23
HAWKINS CREEK

PROPOSED
STRUCTURE

Base:
2012 0.5ft Color Orthoimagery
from Utah AGRC, <http://gis.utah.gov/>
Elevation:
2006 2.0m Geoprocessed LiDAR
from Utah AGRC, <http://gis.utah.gov/>

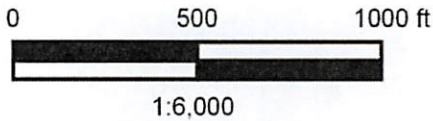


FIGURE 2
AERIAL COVERAGE



Hawkins Creek Lot 22 & 23
Job No. 2129-01N-16










LOT 22 AND 23
HAWKINS CREEK



EXPLANATION

Geology (after King et al., 2008)

-  Qafy - Alluvial fan deposits, younger
-  Qc - Colluvial deposits
-  Qmc - Landslide and slump, and colluvial deposits
-  Qms - Landslide and slump deposits
-  Qmsy - Landslide and slump deposits, younger
-  Qmso(Tn) - Landslide and slump deposits over Norwood Formation rocks
-  Tn - Norwood Formation rocks

Base:
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.

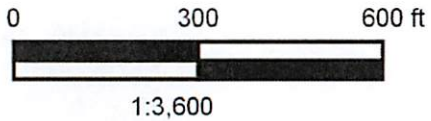


FIGURE 3
GEOLOGIC MAP



Hawkins Creek Lot 22 & 23
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Chaparral Rd.

LOT 22 AND 23
HAWKINS CREEK

TP-3

TP-1

B-2








B-1

TP-3

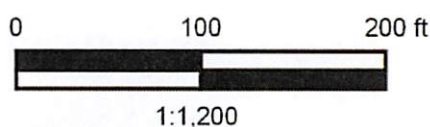
A

A'

EXPLANATION

-  Proposed Structure Location
-  Lot Boundaries
-  Drainage Easement Area
-  Proposed Boring Location
-  Proposed Test Pit Location
-  Proposed Trench Location
-  Proposed Geological Cross Section Line

Base:
2012 0.5ft Color Orthoimagery
from Utah AGRC, <http://gis.utah.gov/>
Elevation:
2006 2.0m Geoprocessed LiDAR
from Utah AGRC, <http://gis.utah.gov/>



**FIGURE 4
SITE PLAN**

