AGEC
Applied GeoTech

October 23, 2025

Powder Mountain Ski Resort
3923 North Wolf Creek Drive
Eden, Utah 84310

Attention: Erik Anderson
EMAIL: eanderson@powdermountain.com

Subject: Geologic Hazard Assessment
Prado Subdivision Phase 1
Powder Mountain, Utah
Project No. 1250702

Erik:

Applied Geotechnical Engineering Consultants, Inc. was requested to review the geologic hazards that may affect development of the Prado Phase 1 Subdivision. The site is located within the Powder Mountain Resort in Weber County, Utah at approximate Latitude 41.3566° North and Longitude 111.7516° West (see Figure 1).

PROPOSED CONSTRUCTION

We understand that 50 residential building lots, 17 retaining walls and associated improvements are proposed for a 125 acre area.

SCOPE

We reviewed a geologic hazard assessment report of the northeast end of Prado Phase 1(formerly Bobcat Ridge) prepared by IGES with report date September 20, 2018 and Project No. 01628-028. A site reconnaissance was performed by an AGEC geologist on October 3, 2025; as well as a review of Lidar data acquired by Utah State in 2016, a geology map of the area by Anderson and others (2023) and McDonald and others, (2025) (see Figure 1), the Utah Geological Survey Geologic Hazards Portal, and stereo-pair aerial photographs dated August 10, 1946, numbered AAJ-1B-89 and 90. The photographs were obtained from the Utah Geological Survey digital imagery website and have a reported scale of 1:20,000.

GEOLOGIC CONDITIONS

Regional Geology

Prado Phase 1 subdivision is located in the western portion of the northern Wasatch Mountains, approximately 5 miles northwest of Eden Utah. The modern Wasatch Mountains begin uplifting approximately 12 to 17 million years ago during the Late Tertiary. Although the ancestral Wasatch Mountains were uplifted during the Cretaceous and heavily eroded. Approximately 38 to 24 million years ago, magma intruded into where the current Wasatch Mountains sit and helped form the core of the range we see today (Milligan, 2000). The Wasatch Mountains have been heavily altered since their uplift by glacial, fluvial and lacustrine processes.

The Middle Rocky Mountains Province, which the Wasatch Mountains are a part, was uplifted as a block along the Wasatch Fault. The Wasatch Fault is a part of a 230-mile long zone of normal faulting called the Wasatch Fault Zone. The zone has documented evidence of Pleistocene and Holocene movement as well as some historical movement. The faults associated with the Wasatch Fault Zone are normal faults with typical block movement down to the west and up to the east (Lund, 1990).

Site-specific Geology

The Prado Phase 1 site geology consists predominately of Tertiary Wasatch Formation with Quaternary mass movement deposits, such as landslide and soil creep, as well as slope colluvium.

The Tertiary Wasatch Formation consists of reddish orange to yellowish orange, cobble to boulder conglomerate with varying amounts of mudstone and sandstone. It forms boulder strewn slopes but generally does not outcrop. It lies on a sharp unconformity over paleotopography (Anderson, 2023). It is relatively flat and lies at the top of the ridge dividing the north and south portions of the subdivision (see Figure 1).

Various undivided Quaternary mass movement deposits (Qmc and Qms) are mapped on the north side of the ridge and the far south portion of the project site (see Figure 1). There are glacial erosional features (Qmg) to the west of the project site.

Review of Aerial Imagery

A series of aerial imagery that cover the project area, numbered AAJ-1B-89 and 90, were taken from the UGS Aerial Imagery Collection and reviewed stereoscopically for geologic conditions that may negatively affect the project area. These photos were from 1946.

No geologic lineaments or fault scarps were observed. Hummocky topography, possibly associated with landslides or soil creep, was observed in areas of little to no vegetation. Several crescent shaped structures were observed on the southern part of the ridge and one

in the northwest portion of the site. These could be indicative of landslide scarps. A few of the southern crescent structures are mapped by McDonald and others (2025) as landslide head scarps.

Google earth imagery from 1985 and 2025 were also reviewed. The area has remained relatively unchanged other than development to the northeast of the site. There is evidence of a spring in the northwest part of the property.

No bedrock outcrops were observed anywhere on the property.

Review of Lidar Imagery

Along with the aerial photos, lidar imagery of the area, captured in 2016, was reviewed. The imagery was downloaded from the Utah Automated Geographic Reference Center Web Page. The crescent shaped structure observed in the aerial photos are also observed in the lidar imagery. Several more areas of hummocky topography with faint crescent structures, possibly landslide head scarps, are observed north of the ridge.

A roughly circular structure is observed near where McDonald and others (2025) mapped a sinkhole.

Literature Review

A geologic hazard assessment report of the northeast end of Prado Phase 1(formerly Bobcat Ridge) prepared by IGES with report date September 20, 2018 and Project No. 01628-028 was reviewed. The IGES map (see Appendix) shows that shallow landslide deposits were encountered in the southern test pits, that area was labeled Slide C. Older and deeper landslide failure planes were encountered in the northern section, labeled as Slide A & B. A landslide head scarp was mapped by IGES in the northwest portion of the project area. Based on test pit logs presented in the IGES report, the subsurface materials at the site consist of a mixture of clay, sand and gravel. IGES' TP-1 shows a fat clay overlying the Calls Fort Shale Member.

Two Utah Geological Survey maps were reviewed that cover the project area, the Huntsville Quadrangle by McDonald and others (2025) and the Browns Hole Quadrangle by Anderson and others (2023) Both maps show the northern part of the Prado Phase 1 area as undivided mass-movement deposits and colluvium. Anderson and others (2023) maps outcrops of the Cambrian Calls Fort Shale and Bloomington Formation near the bottom of the drainage directly north of the project site.

Site Conditions

A site reconnaissance was performed by an AGEC geologist on October 3, 2025 to determine if there is evidence of recent ground movement. Some of the tree trunks north of the ridge are curved at the base with curvature in the downslope direction.

The project site is undeveloped. There is an unpaved road that generally follows the ridge which is oriented south-southwest to north-northeast through the central portion of the proposed development. There are wet areas in the northwestern portion of the property as noted by IGES on their Figure A-2 and observed during our site visit. The ground surface north of the ridge slopes down to the northwest at approximately 3 ½ horizontal to 1 vertical and flatter. The ground surface to the south of the ridge slopes to the south at approximately 8 horizontal to 1 vertical and flatter.

Vegetation on the project site consists of grass, brush and trees.

The Shelter Hill subdivision (Project # 1250186) is to the northeast of the project site. The rest of the surrounding land is undeveloped.

GEOLOGIC HAZARD ASSESSMENT

Landslides/Mass Movement

Test pits excavated on the south side of the ridge (see Figure 2) show predominantly clayey gravel of the Tertiary Wasatch Formation down to approximately 15 feet. Test Pits 8 and 12 have a layer in sandy fat clay between 8 and 12 feet below the ground surface.

During our site reconnaissance on October 3, 2025, we found evidence of scarp-like structures in the northwest portion of the property, near the water seep. Many of the trees on the north slope have downhill curvature of tree trunks, an indication of slope movement. We observed less distinct scarp-like structures in the central portion of the project area that we interpret as older landslides. The southern portion showed no evidence of soil creep or scarp-like structures other than the south end of the site (see Figure 2). We recommend additional geologic evaluations be conducted on these structures to look for evidence of landslides.

The latest geology map for the area (Anderson and others, 2023 and McDonald and others, 2025) shows mass movement and colluvial deposits undifferentiated for most of the lot. These are described as mixed landslide, slump, slope wash, and soil creep deposits with a slightly hummocky appearance and lacks clear landslide scarps and lateral margins. Review of aerial photographs, site reconnaissance, and lidar data finds potential landslide deposits. Figure 2 is a geology map based on our review of the site.

Surface Fault Rupture and Earthquake Hazards

There are no Quaternary fault traces extending through or near the site based on review of the Utah Geological Survey Geologic Hazards Portal and the recent geology map of the area. There are no lineations in the area of the site that would be consistent with active faults on the aerial photographs and lidar data reviewed. The Wasatch Fault is approximately 10 miles to the west. Fault surface rupture is not considered to be a hazard at the project site.

Ground shaking as a result of an earthquake, given the distance to the Wasatch Fault, is considered to be a hazard for the project site. This hazard will be mitigated through structural design.

Rockfall

Although there are steeply sloping areas of the project site, there are rockfall sources on or above these slopes. Rockfall is not considered to be a hazard at the project site.

Liquefaction

Liquefaction is not considered a hazard for the project site because of the shallow depth to bedrock and the soil type.

Debris-Flows and Flood Hazards

The project site does not contain or lie adjacent to drainages and lies mostly near the top of a slope, debris flow is not considered to be a hazard.

Shallow Depth to Water

Water was encountered in more than half of the test pits excavated by IGES in the northern part of the project site. A water seep/spring is located in the northwest part of the project site. Therefore, water can be expected at a shallow depth during some times of the year. Perched water conditions should be expected during snow melt and wet times of the year.

Expansive Soils

Layers of expansive clays were found in many of the test pits. Therefore we consider expansive soils to be a potential hazard at the site.

CONCLUSIONS

Based on our geologic review of the site, it is our professional opinion that potential landslide, expansive soils, shallow groundwater, and strong earthquake ground motions are geologic hazards that may negatively affect the proposed development of the site. Earthquake ground motions are mitigated through structural design of the building. A geotechnical study is recommended to address the other hazards identified. Additional geologic evaluation is recommended as part of the geotechnical study to assist in th stability analysis for the project.

LIMITATIONS

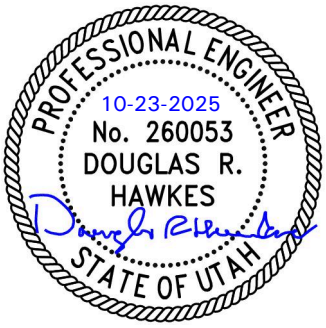
This letter has been prepared in accordance with generally accepted geologic engineering practices in the area for the use of the client. The conclusions included in the letter are based on review of the information noted. Variations in geologic conditions can be expected and may not become evident until additional exploration or excavation is conducted. If the geologic conditions or the proposed construction is significantly different from what is described in this letter, we should be notified to reevaluate our conclusions.

If you have questions or we can be of further service, please call.

Sincerely,

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

Trae D. Boman, G.I.T.



Reviewed by Douglas R. Hawkes, P.E., P.G.

TDB/rs

Reference:

Anderson, Z.W., McDonald, G.N., Balgord, E.A., and Yonkee, W.A., 2023, Interim geologic map of the Browns Hole quadrangle, Weber and Cache Counties, Utah: Utah Geological Survey Open-File Report 760, 13 p., 2 plates, https://doi.org/10.34191/OFR-760.

AGRC, 2016, Utah Automated Geographic Reference Center Web Page, Raster Data Discovery, accessed October 7, 2025, https://raster.utah.gov/

IGES, Inc., 2018, Geological Hazard Assessment, Bobcat Ridge Subdivision, Summit at Powder Mountain Resort, Weber County, Utah, IGES Project No. 01628-028, dated September 20, 2018

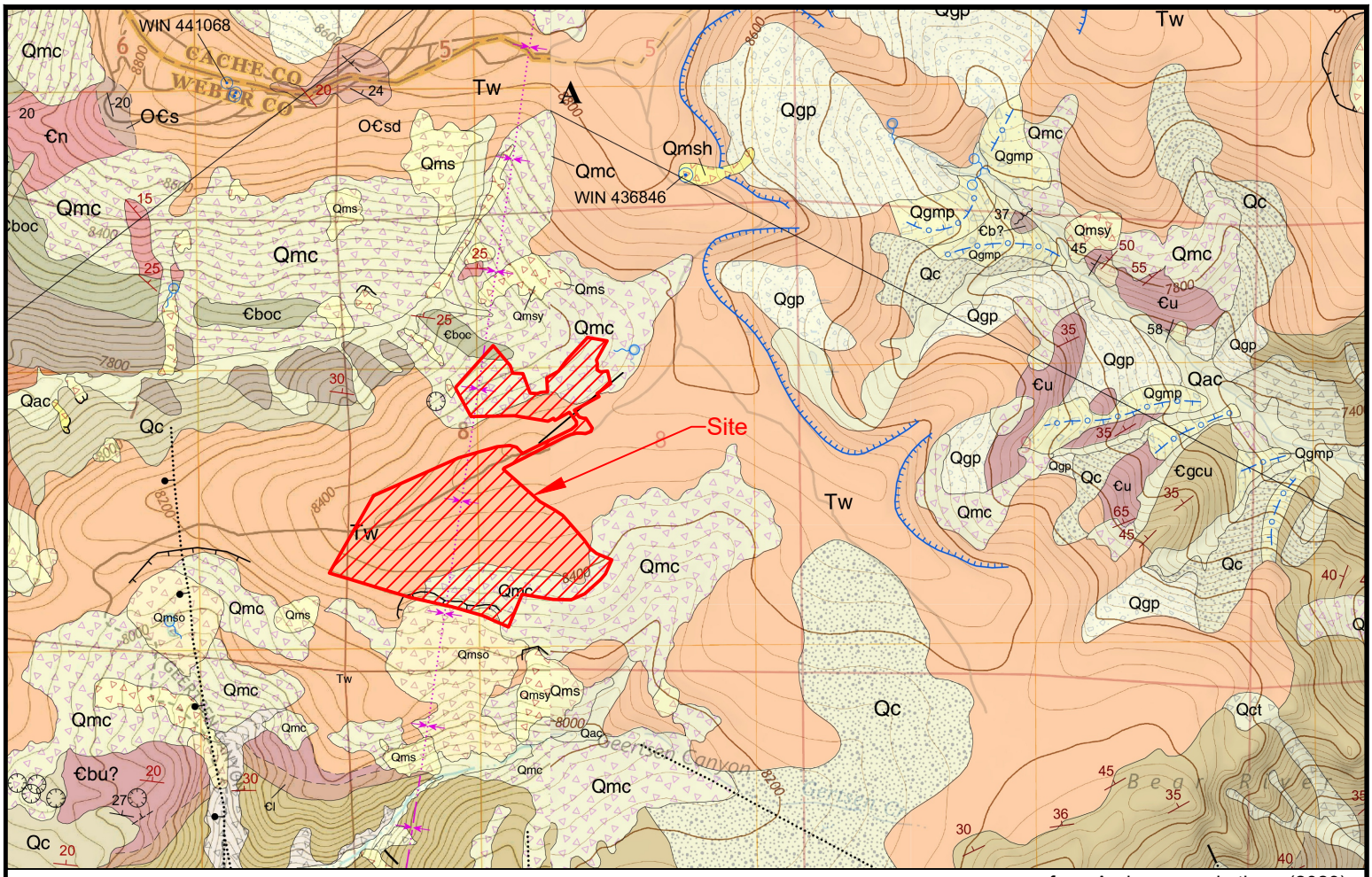
Lund, W.R., 1990, editor, Engineering geology of the Salt Lake City Metropolitan area, Utah: Utah Geological Survey Bulletin 126, 66 p.

McDonald, G.N., McKean, A.P., Anderson, Z.A., Balgord, E.A., and Yonkee, W.A., 2025, Interim geologic map of the Huntsville quadrangle, Weber and Cache Counties, Utah: Utah Geological Survey Open-File Report 772DM, 26 p., 2 plates, scale 1:24,000, https://doi.org.10.34191/OFR-772DM.

Milligan, M.R., 2000, How was Utah's Topography Formed? Utah Geological Survey, Survey Notes, v. 32, no. 1, pp. 10-11

Utah Geological Survey, 2025; Utah Geologic Hazards Portal accessed October 6, 2025 at, http://geology.utah.gov/apps/hazards/.

Utah Geological Survey, 2016, Utah Geological Survey Aerial Imagery Collection, https://imagery.geology.utah.gov/pages/geo_search.php



from Anderson and others (2023)
and McDonald and others (2025)

EXPLANATION OF SYMBOLS AND GEOLOGIC UNITS IN AREA OF PROPOSED DEVELOPMENT

Qmsy - Younger landslide deposit (Historical? to Middle Pleistocene).

Qmc - Mass-movement and colluvial deposits (Holocene to middle Pleistocene).

Tw - Wasatch Formation (Eocene to Plaeocene).

Ꞓboc - Calls Fort Member of Bloomington Formation (Middle Cambrian).

Geologic contact between units, dashed where approximate.

Normal fault, bar and ball on down thrown side, dashed where approximate, dotted where concealed.

Landslide scarp - Dashed where approximately located, hactures on down dropped side.

Hinge line of syncline - Dashed where approximately located, dotted where concealed.

Sinkhole

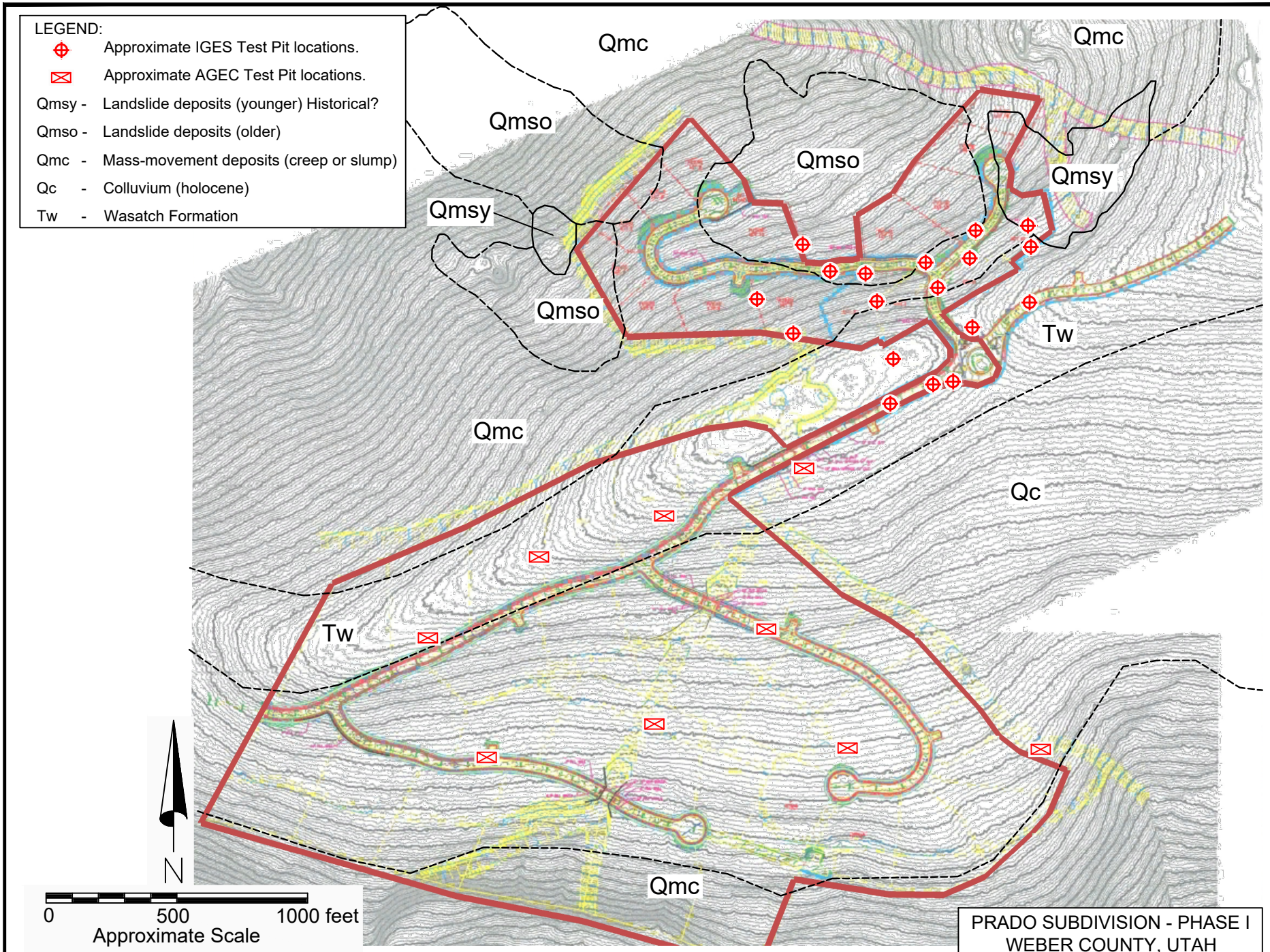
Spring

N

0 2000 4000 feet
Approximate Scale

PRADO SUBDIVISION - PHASE I
WEBER COUNTY, UTAH

1250702	AGEC	Geologic Map	Figure 1



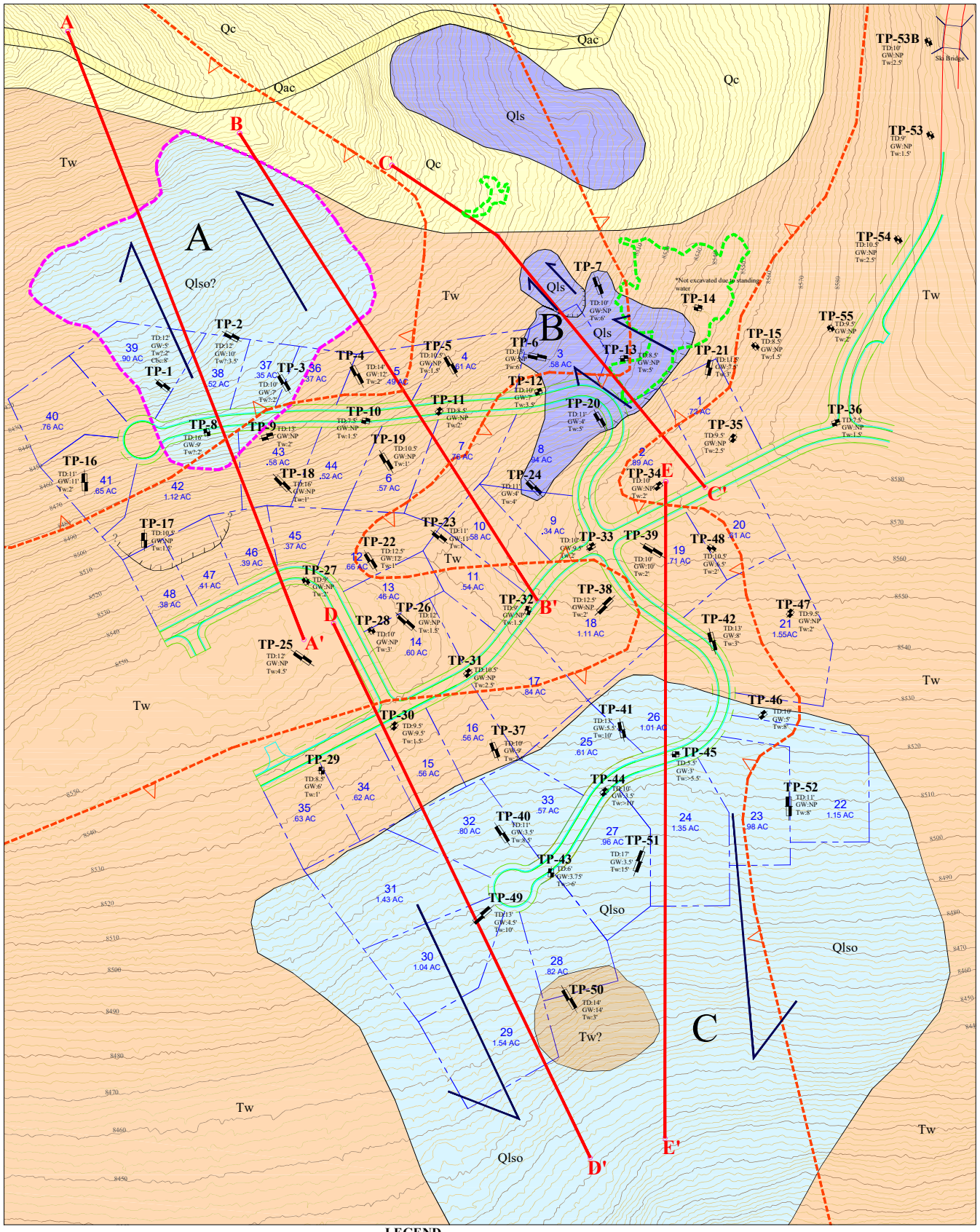
Base Map by Talisman 10/16/2025

1250702	AGEC	Test Pit Locations and Geologic Map	Figure 2

APPENDIX

IGES Geologic Map

Project No. 1250702



LEGEND

Basemap:

-Bobcat Ridge Preliminary Plat, provided by Talisman Civil Consultants, dated 8-13-2018

Contour Interval: 2'

*All Geologic Contacts Approximate

- Qac — Alluvial and Colluvial Deposits
- Qc — Colluvium
- Project Boundary
- Deeper clay seam area; possible older landslide
- Qls — Landslide Deposit (Holocene-aged)
- Qlso — Older landslide deposit (Pleistocene-aged)
- Cross-Section
- Delineated Wetland Area
- Tw — Wasatch Formation
- Test Pit Location (TP-1)
  - TD = Total depth
  - GW = Groundwater depth (NP=Not Present)
  - Tw = Depth to Wasatch Fm
  - Cbc = Depth to Calls Fort Shale
- Landslide Scarp; queried where uncertain
- Landslide direction of movement
- Area of Shallow Groundwater (~10' below existing grade)
  Triangle points in direction of groundwater

A= Landslide A

B= Landslide B

C= Landslide C

N

0 100 200
FEET

1" = 100'

IGES®

Project No: 01628-028

Geotechnical and Geologic Hazards Assessment
Bobcat Ridge Subdivision
Summit Powder Mountain Resort
Weber County, Utah

Geotechnical and Local Geology Map

Figure

A-2