Exhibit D-2

Gilpin Geosciences, Inc
Earthquake & Engineering Geology

January 24, 2020
91650.01

Annalee Sanborn
PPI Engineering, Inc.
2800 Jefferson Street
Napa, California 94558

SUBJECT: REVISED
Landslide Investigation: Response to Comments
V. Sattui Hibbard Ranch Vineyard,
Henry Road
Napa, California

Dear Ms. Sanborn:

We are pleased to present the results of our supplemental Landslide Investigation: Response to Comments. The proposed vineyard development is presented by PPI Engineering Inc. in their "V. Sattui Winery Inc. Hibbard Ranch Erosion Control Plan" dated January 2019.

The County of Napa has provided comments to the proposed vineyard development in two communications:

- Memorandum Re: P19-00069 – V. Sattui Hibbard Ranch Completeness Comments Rev. 1 APN: --5-380-014: County of Napa Planning, Building & Environmental Services, 2 p., dated 5/14/19.
- Application Completeness Determination – V. Sattui Hibbard Ranch Vineyard Conversion Agricultural Erosion Control Plan (ECPA) File # P19-00069-ECPA Terminus of Henry Road: APN 050-380-014; Napa County Planning Building & Environmental Services, 3 p., dated 5/21/19.

The site is located on Henry Road southwest of the incorporated City of Napa, as shown on Figure 1. The proposed development involves installation of 9 vineyard blocks across the upland areas of the ridges overlooking the Carneros Valley. The site consists of approximately 425 acres. Unimproved dirt roads and tracks access the site. Numerous structures are located on the west side of Henry Road that serve as storage and working facilities for the farming operation.

In this letter report we present supplemental subsurface exploration and recommendations for landslide mitigation based on recent field exploration and a geologic reconnaissance, and respond to the County comments.

SCOPE OF SERVICES

The purpose of this investigation was to respond to comments from the County of Napa regarding slope stability issues and to analyze potential landslide mitigation alternatives. In order to accomplish this, we performed the following tasks:

- selected limited site geologic reconnaissance;
- review aerial photographs;
- log 5 test borings at selected landslide sites drilled by Taber Drilling on 18 & 19 July 2019;
- compile the geologic data and performed analyses in order to recommend landslide mitigation; and
- prepare this report.

SITE CONDITIONS

We evaluated selected sites by performing subsurface exploration and geologic reconnaissance to better define the slope stability hazards to the proposed vineyard development, and to address comments from the County. We presented the site-specific and vicinity geology and seismicity in our previous report (Gilpin Geosciences, 2019) and refer you to that for further background information.

For this investigation, we focused on 5 areas of slope stability concern, as follows:

1. landslide failure of access road below Block 4A
2. landslide in Block 5
3. landslides in Block 6C
4. deep erosion gullying in Block 7A
5. landsliding in Block 9

We also discuss the impact of landslides mapped near Block 1 and Block 8 in the following section.

SITE GEOLOGY

We have characterized the landslides by their activity. Active landslides are mapped based on the sharpness of the surface features associated with the deposit. Well-defined and sharp features such as open cracks in the head scarp area, bulging and ground-cracked toe areas and bulging ground surface areas, and "mole tracks" marking the lateral margins of the active slide. Whereas surface features associated with dormant or inactive landslides are marked by rounded to very subtle head scarp areas, a lack of fresh scarps and subdued toe areas. Lateral margins of dormant landslides do not have fresh scarps and "mole tracks" composed of loose soil.

Landslide Block 1A/1C
We mapped a 5- to 10-foot-deep earth flow landslide on the northern flank of the ridge crest (Figure 2) on which vineyard Block 1A and 1C are proposed. This slide has developed in a narrow swale drainage that lies between the two blocks. The proposed ridge crest vineyard blocks should be setback from future potential encroachment by this landslide.

Two additional landslides are mapped northwest of vineyard Block 1D; however, we believe these earthflow landslides are located downslope of the proposed vineyard boundary and beyond any zone of potential impact to the vineyard.

Road Landslide below Block 4A
We mapped a landslide that failed in an existing access road that traverses the hillside below and east of Block 4A. The Site Geologic Map, Figure 3A, shows the location and approximate dimensions of the landslide that occurred during the winter storms of 2018-19, and Figure 3B shows a cross section with a subsurface geologic interpretation. The landslide is a slump of the shallow bedrock and incorporating the fill placed to construct the roadway. The slide is approximately 45 to 50 feet wide and extends from a head scarp just above the roadway to just below the fill placed for the road construction. We drilled boring B-1 in the roadway. We describe the subsurface conditions in the next section and the log of the boring is included in the Appendix.

Landslide Block 5
We mapped a translational landslide that encroaches on Block 5, as shown on Figure 4A. We estimate the landslide to be approximately 20 feet deep as shown on the cross section presented on Figure 4C. In nearby test pit TP-6 (Gilpin Geoscience, 2019), we encountered siltstone bedrock at a depth of 4.5 feet BGS.

Landslides Block 6C
Vineyard Block 6C lies on a prominent southwest-facing slope with relief of 80 to 100 vertical feet. We have identified 3 landslides in the Block, one of which was shown in original engineering geologic report (Gilpin Geosciences, Inc. 2019). Based on additional field reconnaissance and aerial photograph review, we identified two more landslides, one of which we designate dormant.

Active landslides
We mapped a moderate-size slump landslide (Qls 1351) emanating from the steep ridge at the top of the Block that is approximately 80 feet wide and extends up to 270 feet into the proposed vineyard block (Figure 4A). We estimate the depth of this landslide to be up to 30 feet deep BGS, as shown on the cross section presented on Figure 4B.

A second active debris landslide (Qls 1121) was identified at the far northwestern corner of the block that is estimated at approximately 5 to 10 feet deep. Test Pits

TP-4 and TP-5 in the area encountered old alluvium at a depth of 2.5-3.5 feet BGS underlain by siltstone/sandstone bedrock at 3.75-7 feet BGS (Gilpin Geosciences, Inc, 2019).

Dormant Landslide

We mapped a dormant debris landslide (Qls 2121; Figure 4A) at the easternmost part of Block 6C based on review of infrared aerial photography. The deposit is subdued and poorly defined except in the lower courses of the swale drainage in which it is situated. The slide is approximately 60 to 90 feet wide in the proposed vineyard Block and we estimate it to be approximately 15 to 20 feet deep as shown on the cross section presented on Figure 4B.

Erosion Gully Block 7A

We performed site geologic reconnaissance (Figure 5A) and PPI Engineering surveyed a cross section of the erosion gully (Figure 5B) at the lower elevation of Block 7A. The gully is eroded into an uplifted alluvial terrace deposit and drops approximately 30 feet over a length of approximately 120 feet. We show an average top of channel bank with respect to the channel thalweg on the cross section (Figure 5B). The gully has obviously been a hazard in the past as it currently is locally backfilled with concrete pipe and other solid debris in an attempt to arrest its growth.

Landslides Block 8

Landslides mapped near Block 8 are shown on Figure 2. We also mapped a hillslope that is subject to soil creep on the western flank of the ridgecrest. Vineyard Block 8 is located along the crest of a prominent, roughly north-south trending ridgeline. Three 5- to 10-foot-deep earthflow landslides are mapped on the northwest-facing slope below the northern end of the Block. The two southerly slides appear to be slightly closer than 50 feet horizontal to the local Block boundary. The block boundary should be adjusted to maintain a minimum 50-foot setback from the head scarps of the two landslides.

Landslide Block 9

Block 9 is located at the southwestern corner of the proposed vineyard improvements and is located on a moderately inclined southwest-facing slope above the prominent southwest drainage that cuts the site. Two irregular tributary drainages cut the proposed vineyard block and characterize the hummocky and irregular drainage on this slope. We mapped a large translational landslide roughly bounded by these two drainages (Figure 6A). We explored the landslide by drilling 4 test borings described in the next section. We estimate the depth of this landslide to be 15 to 26 feet BGS based on the test borings and the cross section shown on Figure 6B.

SUBSURFACE CONDITIONS

We explored the site by drilling 5 test borings at the landslides below Block 4A and on Block 9 at locations shown on Figure 3A & 6A. The test borings encountered fill, colluvium[1], landslide deposits, sandstone, and shale. The logs of test borings are attached in Appendix, Figures A-1 through A-5. We classified the materials encountered according to the Soil Classification Chart and Physical Properties Criteria for Rock Descriptions, shown in Figures A-6 and A-7, respectively. We have compiled the geologic data on the Site Plan and Geologic Map (Figures 3A & 6A) and present our interpretation of subsurface conditions on the Geologic Cross Sections shown on Figures 3B & 6B.

Boring B-1 was drilled in the road below vineyard Block 4A where a landslide slump had occurred during the storms that occurred last winter. We encountered silty to sandy clay and clayey gravel landslide material to a depth of 14 feet below the road surface. The landslide materials were very soft to soft/very loose and moist to wet. We encountered siltstone bedrock below the landslide to the full depth explored 26.5 feet below the road surface. The siltstone is weak to friable locally, of low hardness, and moderately weathered.

Borings B-2 through B-5 were drilled in the landslide mapped on vineyard Block 9. We encountered silty to sandy clay and clayey gravel landslide materials to a depth of up to 29.5 feet BGS at the boring B-1 location. The soils encountered are soft to medium stiff/loose and are moist to wet. We encountered a soft and wet landslide slip plane in boring B-2 at a depth of 25 feet BGS. In boring B-4 we encountered silty clay with gravel residual soil that was stiff to very stiff layered between the landslide materials and underlying bedrock.

Siltstone bedrock was encountered below the landslide materials in all the borings on Block 9. We classified the siltstone as friable to weak with low hardness and moderate weathering. We encountered sandstone bedrock underlying the siltstone in boring B-4 at a depth of 26 feet below ground surface (BGS). The sandstone was friable to weak, of low hardness and deeply to completely weathered.

CONCLUSIONS AND RECOMMENDATIONS

The proposed vineyard development is feasible from the standpoint of erosion control and slope stability. However, active and dormant landslides mapped on the site lie adjacent to and, in some cases, within the proposed vineyard areas. Recommendations for setbacks, as well as slope reconstruction guidelines, are presented below in the event the project team wishes to repair the unstable areas for the proposed vineyard development. Typically, the vineyard blocks are located at the top of the gently rounded ridge lines or along the toe of the slopes

---

[1] Colluvium – a deposit caused by the gravitational accumulation of soil, weathered rock, and organic matter on a hillslope.

where the benches define the drainage channel limits. Both areas are prone to encroachment by slope creep and landslide movement.

Vineyard development proposed for high relief properties contain areas of potential slope instability. In general, vineyard development reduces the amount of sediment delivered to local streams in these high relief areas. Vineyard development allows better control of surface runoff away from erosion-prone hillsides and unstable landslide-blanketed slopes. Likewise, controlling surface runoff reduces the activity of landslides and, thus, reduces the sediment loads to nearby streams and their deleterious effects on the local aquatic resources. Therefore, in our opinion, the proposed vineyard development will reduce the sediment delivered to the on site and downstream areas as a result of the drainage design and erosion mitigation aspects of the ECP.

Irrigation of the vines can cause added infiltration during summer seasons; however, with our recommended setbacks and the absence of high-intensity and long-duration precipitation that occurs during the winter, we believe any summer-time infiltration increase will have little effect.

Excessive watering of the vineyard blocks can lead to accelerated soil creep and landslide movement. Surface runoff should be strictly controlled near landslides to direct the flow away from the unstable mass. Saturation of the toes of landslides, active or dormant, can trigger localized slope failures because of the nature of the underlying weak material.

We recommend a setback, or staging area, along block boundaries that are adjacent to steep landslides or downslope of the toe of landslides. The setbacks are recommended below.

We recommend ripping no deeper than 24 inches in areas of slope stability concern addressed in this report.

Proper maintenance of the surface water drainage facilities and periodic monitoring and immediate attention to eroded areas will minimize the impact of the landslides and erosion gullies to the vineyard blocks.

SOIL CREEP SETBACK/MITIGATION

Soil creep is mapped in several locations across the site and, in some locations, it encroaches on the proposed vineyard blocks. Typically, we map soil creep as incorporating the upper approximately 3 feet of soil and encompassing a well-defined area of the slope on which it is mapped. If left unmitigated, the creep will continue and could result in damage to any new vineyard development. Since shallow groundwater and steep slopes are often the cause of localized soil creep, subdrains are an effective tool for mitigation. We recommend either setting back vineyards approximately 25 feet from the identified soil creep, or installing a subdrain at or near its upslope limits.

EROSION GULLY REPAIR BLOCK 7A

A conceptual repair for the erosion gully on Block 7A is shown on the Cross-Section P-P' Block 7A, Figure 5B. To repair the erosion gully and to mitigate the future impact of concentrated runoff into the gully, we propose that a subdrain be constructed along with regrading of the gully channel. The Cross-Section on Figure 5B shows the drainage improvements along with a list of the construction sequence:

1. Rough grade channel to fit shown piping.
2. Place 18-inch-diameter pipe with 40 feet of perforated pipe at the upper end, wrapped in 140N Mirafi filter fabric.
3. Excavate a basin at the proposed pipeline and backfill with Class II permeable material.
4. Grade back existing oversteepened gully banks to cover pipe and restore natural ground surface, as fill material allows.

LANDSLIDE MITIGATION

Mapped landslides that impact the proposed vineyard development are addressed in this investigation. In this section we present alternative mitigation of the slope stability issues at the site. We characterize the landslide hazards and present both setback and permanent repair alternatives below.

Engineered Buttress Fill Placement

We recommend a keyway be excavated a minimum of 2 feet into competent bedrock or stable alluvium as determined by the project geologist or field engineer. The keyway should be a minimum 14 feet wide unless otherwise specified. Figure 7 shows the schematic details of the earth buttress and keyway section.

After keyway preparation is complete, and the subdrain should be installed along the upslope side of the excavation and the fill should be placed in horizontal lifts not exceeding 8 inches in loose thickness, moisture-conditioned to above optimum moisture content, and compacted to at least 90 percent relative compaction. Each layer of fill should be compacted using a sheepsfoot compactor in a uniform and systematic manner. Compaction should be conducted parallel to the axis of the buttress whenever possible. The fill slope should be constructed in layers such that the surface of each layer is nearly level. If in the opinion of the project geologist or field engineer, the contact surface of the fill layer is too dry or smooth to permit suitable bonding of the surface and subsequent fill layers, it may be necessary to moisture condition, scarify, and recompact the surface prior to placement of succeeding layers of fill materials.

The excavated on-site soil is suitable for re-use as earth buttress fill provided it is free of organic material, debris, and particles larger than six inches in greatest dimension. If the excavated material is too wet to compact to the required compaction, it should be spread out and aerated to lower its moisture content.

Stitch-pier Wall Alternative for Road belowBlock 4A

We present two mitigation alternatives for the road repair below Block 4A, depending on your needs. The two alternatives are:

1. Install a row of closely spaced drilled piers to act as a stitch-pier wall, to be presented as a design-build package for an independent contractor;
2. Excavate fill and soil to bedrock to construct a drained keyway and reconstruct the slope with an engineered fill slope (discussed above);

Stitch-pier Wall
Pier holes with a diameter of at least 18 inches should be drilled at three pier diameters, on center, along the downslope edge of the affected roadway. The piers should extend a minimum of 10 feet into the siltsone bedrock encountered during our subsurface exploration. Steel cages or beams should be placed in the pier holes and backfilled with structural concrete with a minimum 28-day compressive strength of 2,500 pounds per square inch (psi). The pier holes should be clean and free of any water prior to placement of concrete.

Subdrains
Subdrains should be installed in areas of soil creep and landslide repair that have excessive seepage. The keyway is designed to capture and drain significant groundwater at and below the bedrock/soil interface; however, parts of the landslide that are not proposed to be rebuilt with engineered earth buttress may require installation of a subdrain to control the impact of excessive groundwater accumulation.

The subdrain should consist of a four-inch-diameter, perforated (perforations down), SDR 35 PVC pipe (Figure 8). The SDR 35 pipe could be replaced with ADS N-12 as long as the joints are securely taped. The perforated pipe should be covered by 3/4-inch drain rock or Class 2 permeable material wrapped in filter fabric (Mirafi 140NC or equivalent). The subdrain pipe should be sloped to drain at a minimum gradient of one percent to a four-inch-diameter, solid PVC pipe with water-tight connections to transport groundwater to a suitable discharge area. Cleanouts should be provided for each length of pipe that has a bend sharper than 45 degrees and at approximately 200-foot intervals for straight pipe.

RECOMMENDED SETBACKS FROM MAPPED LANDSLIDES

In the event landslide repair is not chosen, we recommend that the vineyard development be limited to areas beyond any impact from the mapped landslides. To accommodate this we present our recommended setbacks in a table below.

TABLE 1: Landslide Setback Inventory

Vineyard Block	Landslide Designation	Minimum Setback
Block 1A/C	Active earth flow;; 5-10 ft deep	25 ft lateral; 50 ft toe/headscarp
Block 4C	Dormant; debris slide; 15-20 ft deep	35 ft lateral
Block 5	Active; translational; 15-20 ft deep	25 ft lateral; 50 ft toe
Block 6	Active; slump; 20+ ft deep;	25 ft lateral; 50 ft toe
Block 6	Active ; debris slide; 5- 10 ft deep;	25 ft lateral; 50 ft headscarp and toe
Block 6	Dormant; debris slide; 15- 20 ft deep;	25 ft lateral; 50 ft headscarp and toe
Block 7B	Active; earth flow; 10–15 ft deep;	25 ft lateral; 50 ft headscarp and toe
Block 7D	Active; debris slide; 10–15 ft deep;	25 ft lateral; 50 ft headscarp and toe
Block 8	Active; earth flows; 0-5 ft deep	25 ft lateral; 25 ft headscarp and toe
Block 8	Active debris slide; 5-10 ft deep	25 ft lateral; 50 ft headscarp and toe
Block 9	Active; translational; 15-30 ft deep	25 ft lateral; 50 ft headscarp and toe

GEOTECHNICAL/GEOLOGICAL SERVICES DURING CONSTRUCTION

During implementation of the above recommendations, we should perform the following services:

- Observe stripping of vegetation and organic soil to confirm suitable soil is exposed;
- Observe the excavated soil to confirm it is suitable for use as engineered fill;
- Observe the keyway excavations and subdrain installation;
- Observe subgrade preparation, placement of fill, and perform field density tests to check the recommended compaction has been achieved;
- Observe any retaining wall foundation excavation, geo-grid placement, backfill suitability, and compaction

LIMITATIONS

Our services have been performed in accordance with generally accepted principles and practices of the geological profession. This warranty is in lieu of all other warranties, either expressed or implied. In addition, the conclusions and recommendations presented in this report are professional opinions based on the indicated project criteria and data described in this report. They are intended only for the purpose, site location and project indicated.

We trust that this provides you with the information you need. If you have any questions, please call.

GILPIN GEOSCIENCES, INC.

Lou M. Gilpin, Ph.D.
Engineering Geologist

ROCKRIDGE GEOTECHNICAL, INC.

Craig S. Shields
Geotechnical Engineer

Attachments: **References**

Figures:

Appendix:

REFERENCES

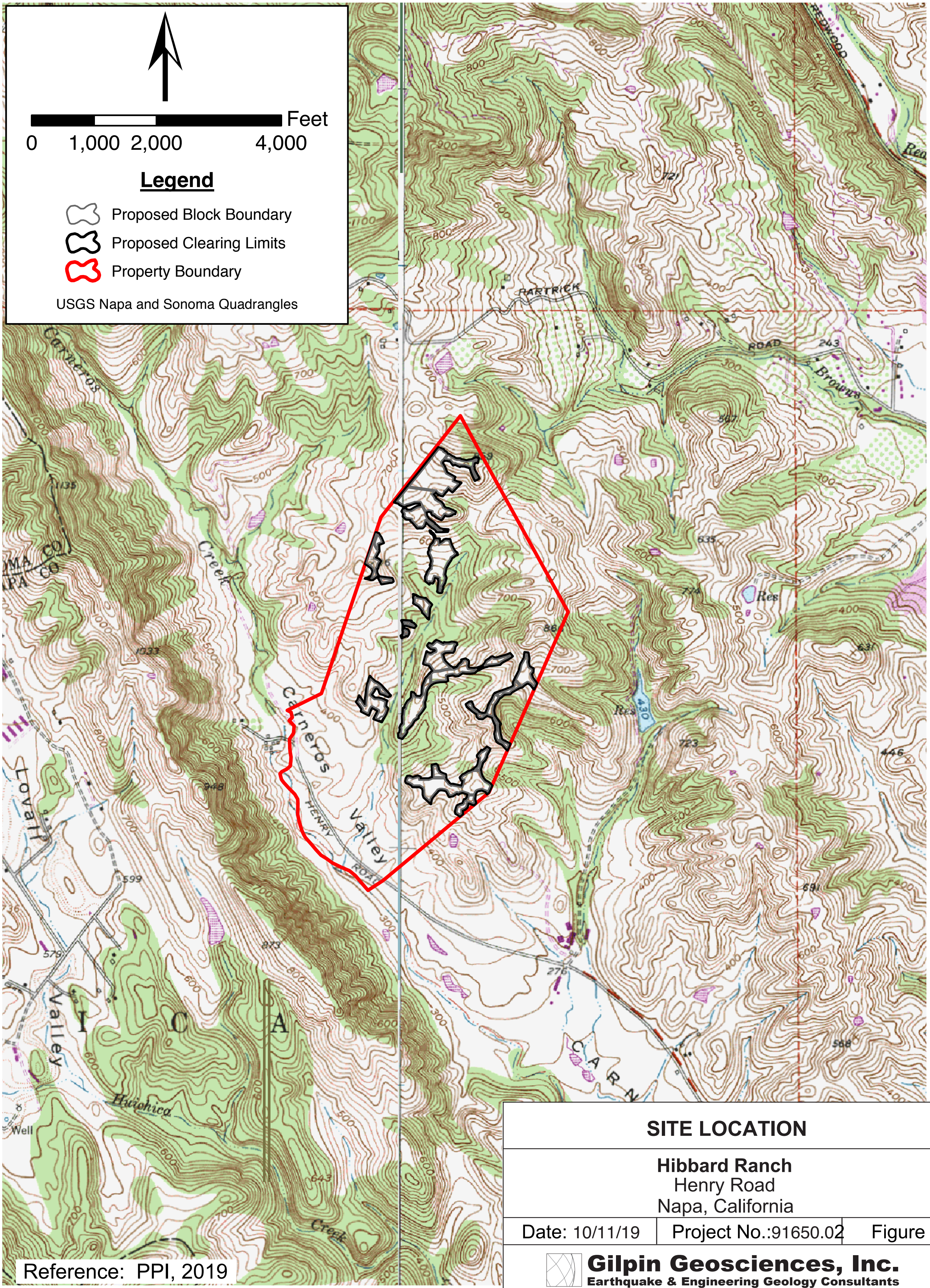
Gilpin Geosciences, Inc., 2019, Engineering Geological Investigation Hibbard Vineyard Henry Road Napa, California: prepared for PPI Engineering, Inc., 41 p., 5 Figures, Appendix, dated 3/7/19.

PPI Engineering, Inc., 2019, V. Sattui Winery Inc. Hibbard Ranch Erosion Control Plan: 58 p., 8 sheets, scale 1”= 100’, dated January 2019

Aerial Photographs

Date	Photo Number	Scale	Source
11/2/00	CIR-6745-3-19,20,21	1:12,000	PAS
9/1/98	CIR 4900-3-7, 8, 9	1:12,000	PAS
10/8/91	AV 4070-19-20,21	1:12,000	PAS

FIGURES

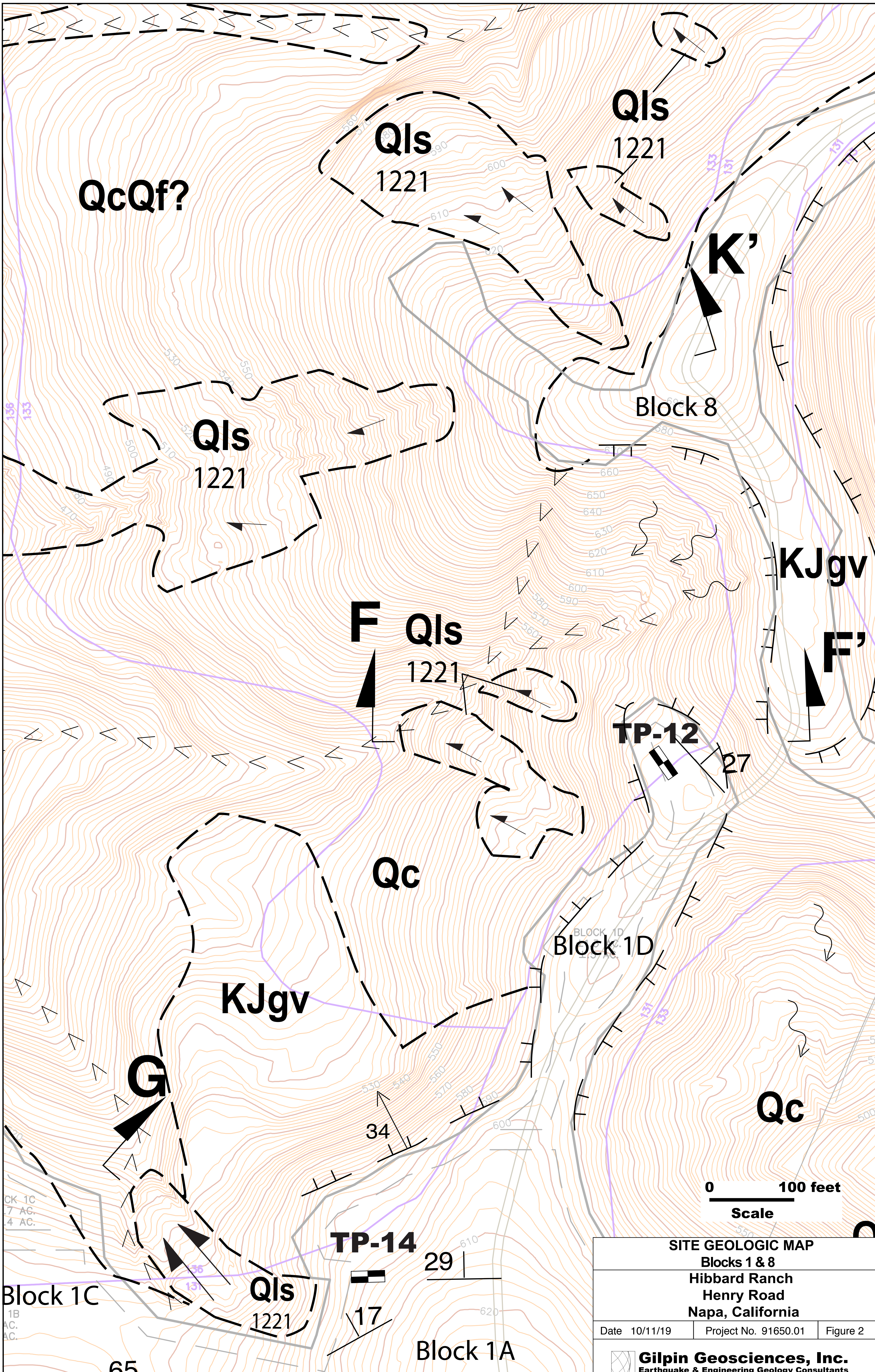


SITE LOCATION

Hibbard Ranch
Henry Road
Napa, California

Date: 10/11/19	Project No.:91650.02	Figure 1

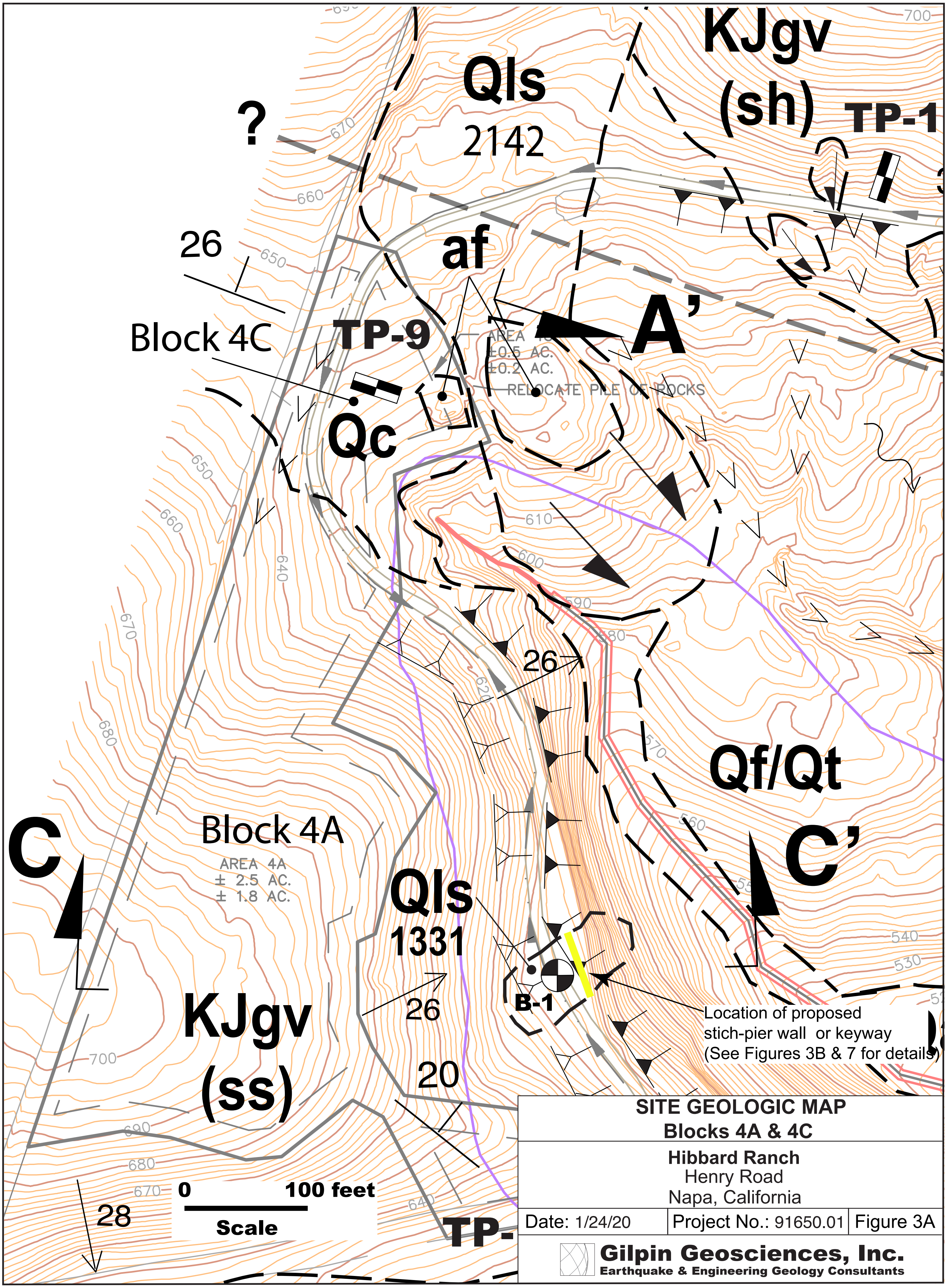
Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants



SITE GEOLOGIC MAP
Blocks 1 & 8
Hibbard Ranch
Henry Road
Napa, California

Date 10/11/19 | Project No. 91650.01 | Figure 2

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

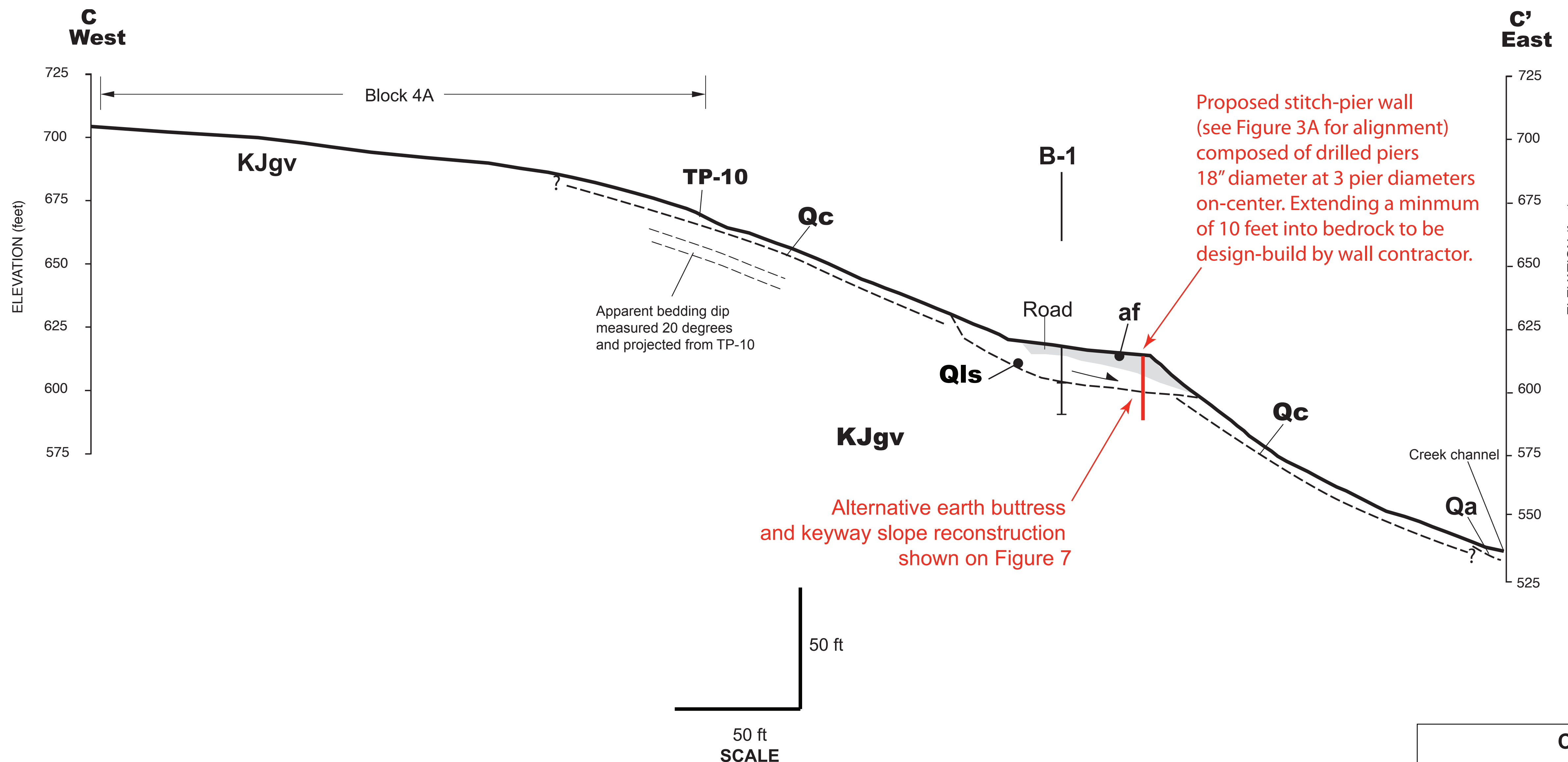


SITE GEOLOGIC MAP
Blocks 4A & 4C

Hibbard Ranch
Henry Road
Napa, California

Date: 1/24/20	Project No.: 91650.01	Figure 3A

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

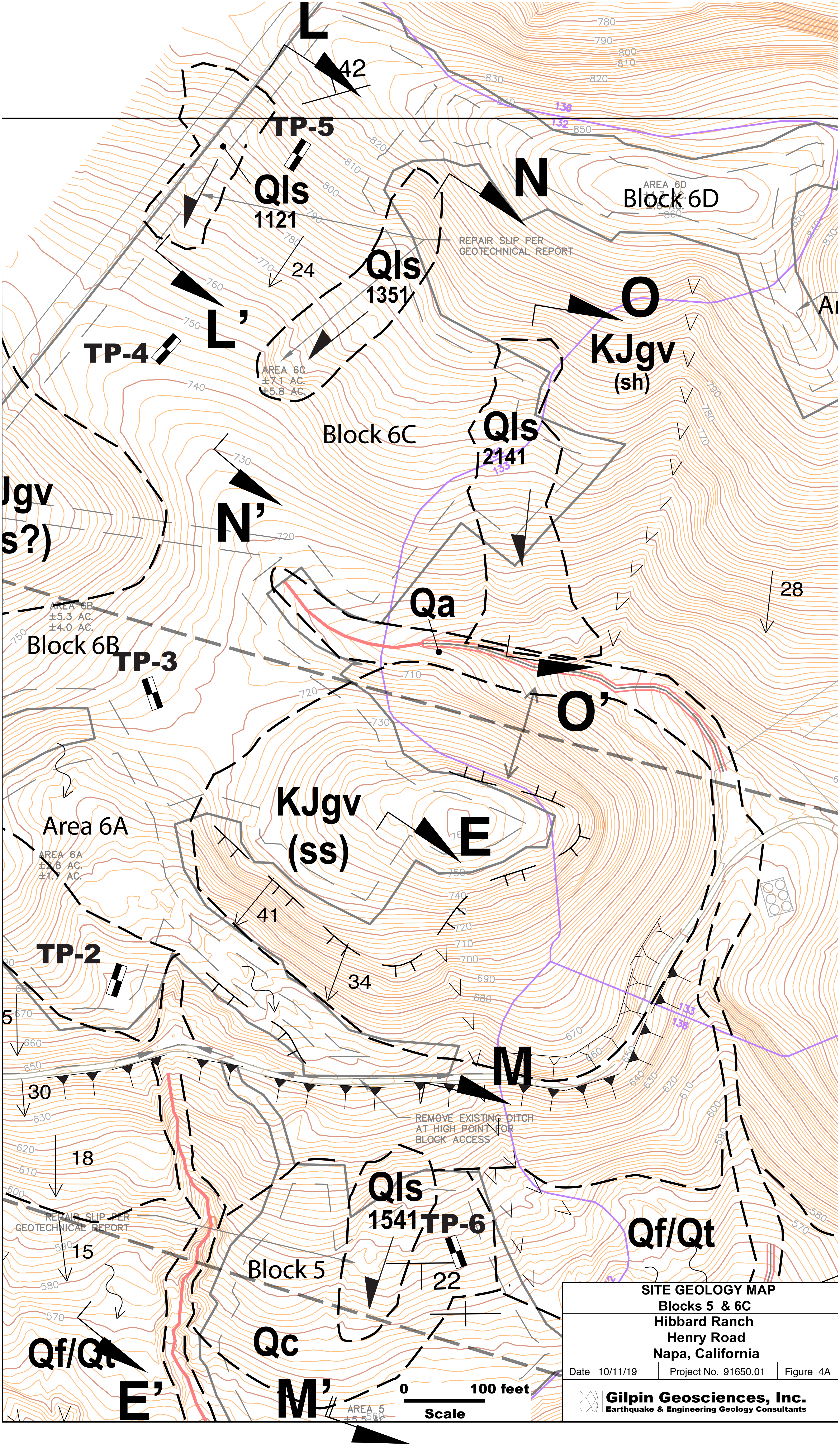


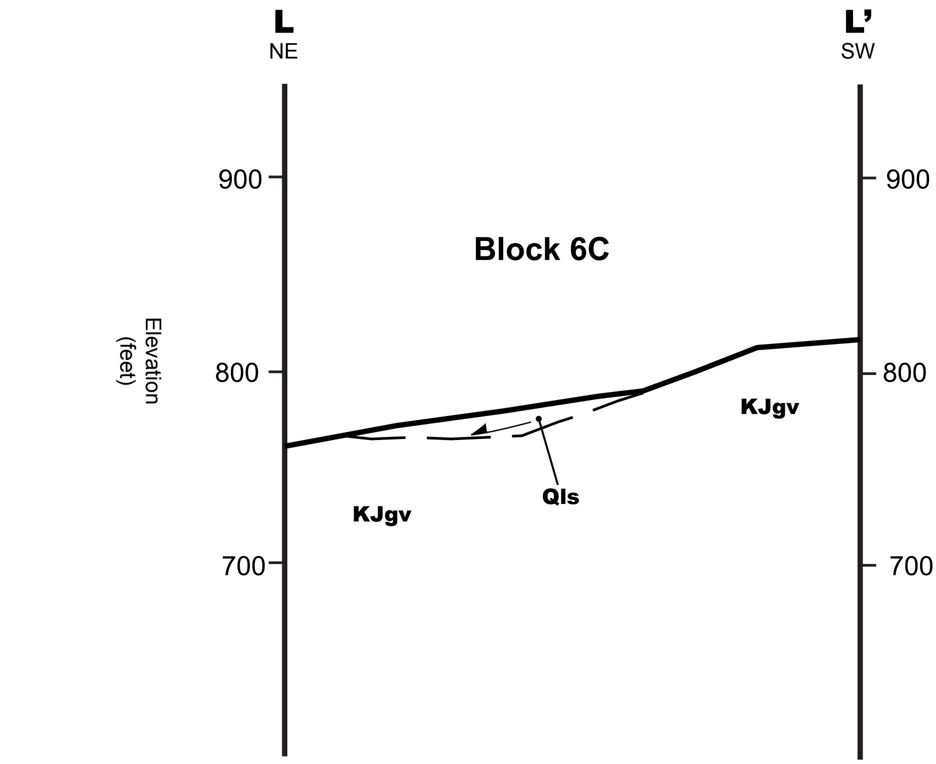
CROSS SECTION
C - C'
Block 4A

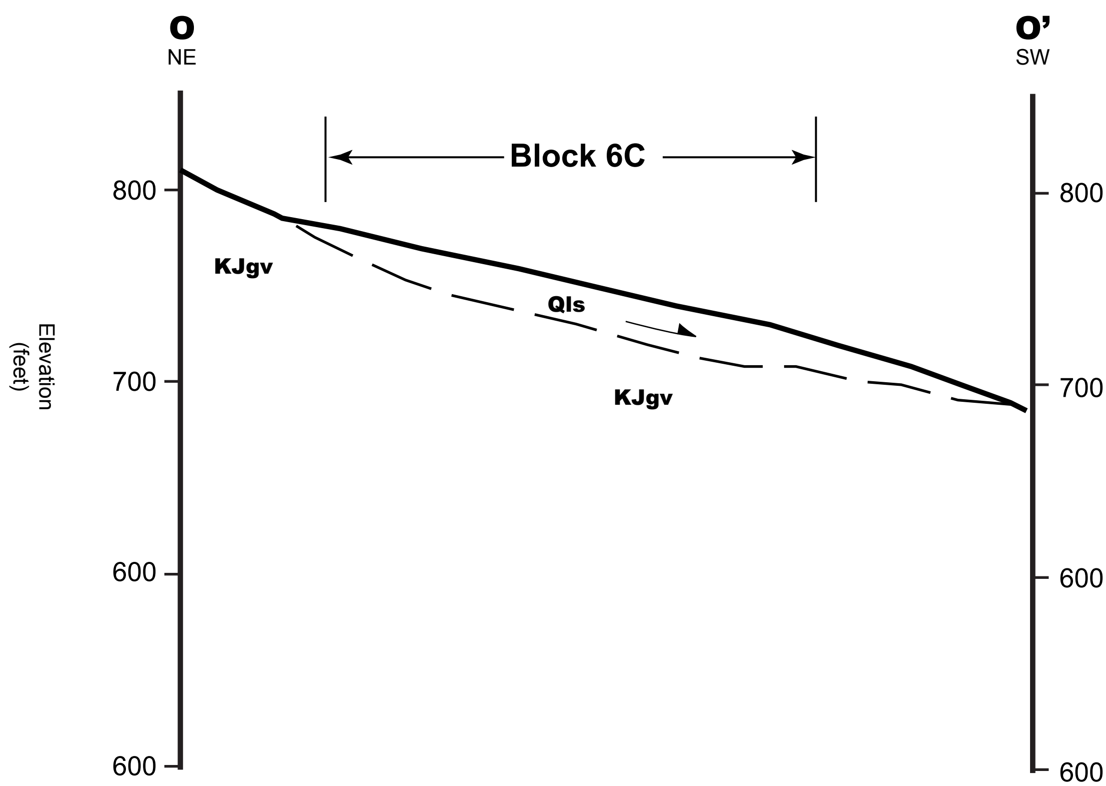
Hibbard Ranch
Henry Road
Napa, California

Date 10/11/19	Project No. 91650.01	Figure 3B

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants


L
L'
N
N'
O
O'
E
E'
M
M'
TP-2
TP-3
TP-4
TP-5
TP-6
Qls 1121
Qls 1351
Qls 2141
Qls 1541
Qa
Qc
Qf/Qt
KJgv (sh)
KJgv (ss)
Jgv (s?)
Block 6D
AREA 6D
Block 6C
AREA 6C ±7.1 AC. ±5.8 AC.
Block 6B
AREA 6B ±5.3 AC. ±4.0 AC.
Area 6A
Block 5
AREA 5
REPAIR SLIP PER GEOTECHNICAL REPORT
REMOVE EXISTING DITCH AT HIGH POINT FOR BLOCK ACCESS
42
24
28
41
34
30
18
15
22
0
100 feet
Scale
SITE GEOLOGY MAP
Blocks 5 & 6C
Hibbard Ranch
Henry Road
Napa, California
Date 10/11/19
Project No. 91650.01
Figure 4A
Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants



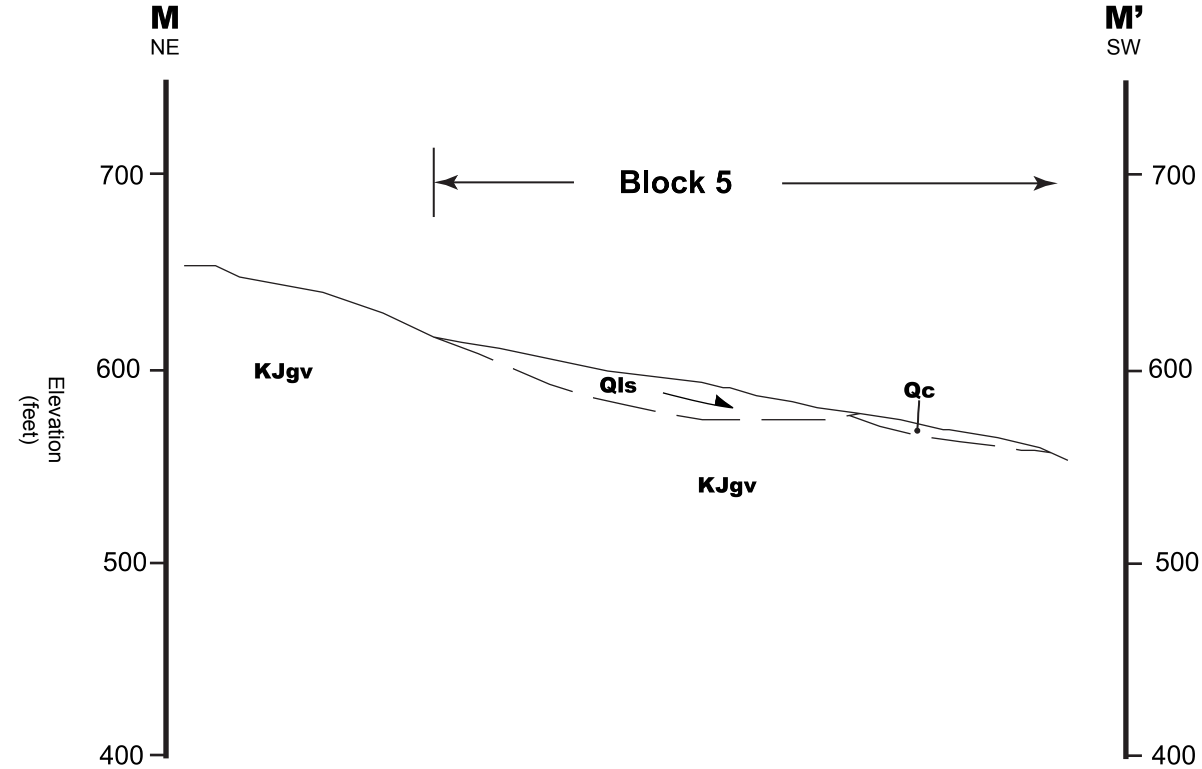


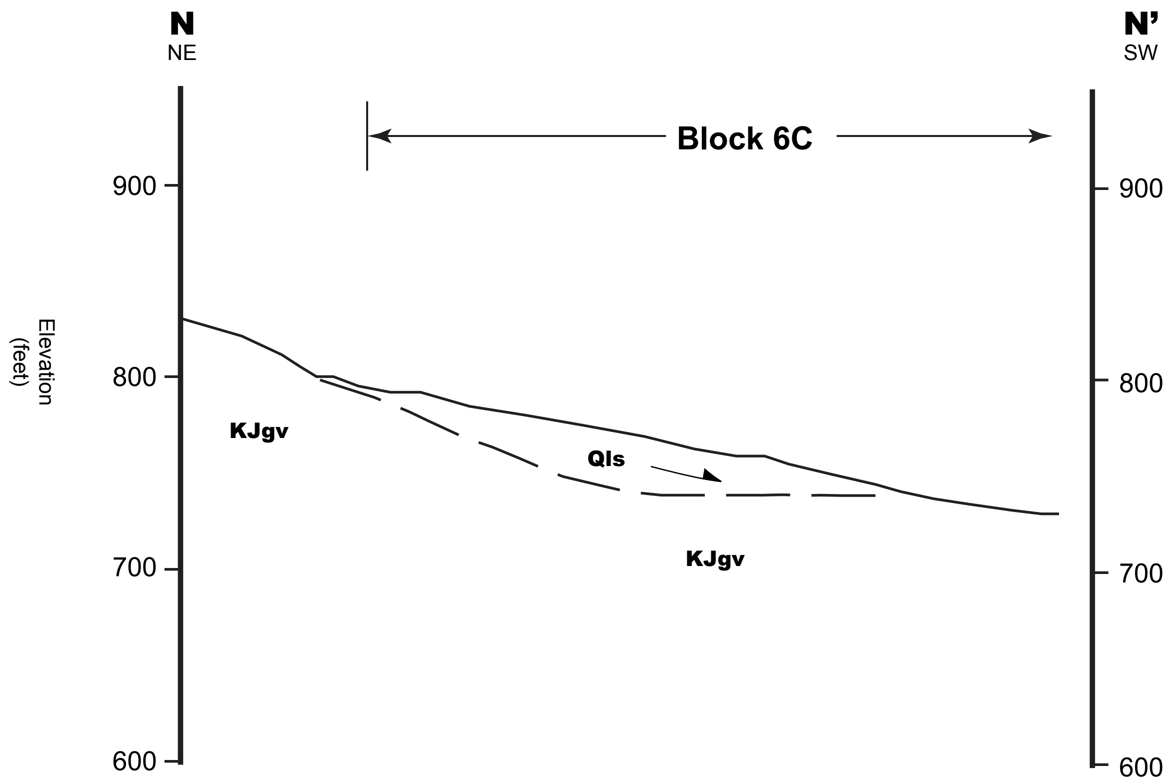
CROSS SECTIONS L-L' & O-O'
Block 6C

Hibbard Ranch
Henry Road
Napa, California

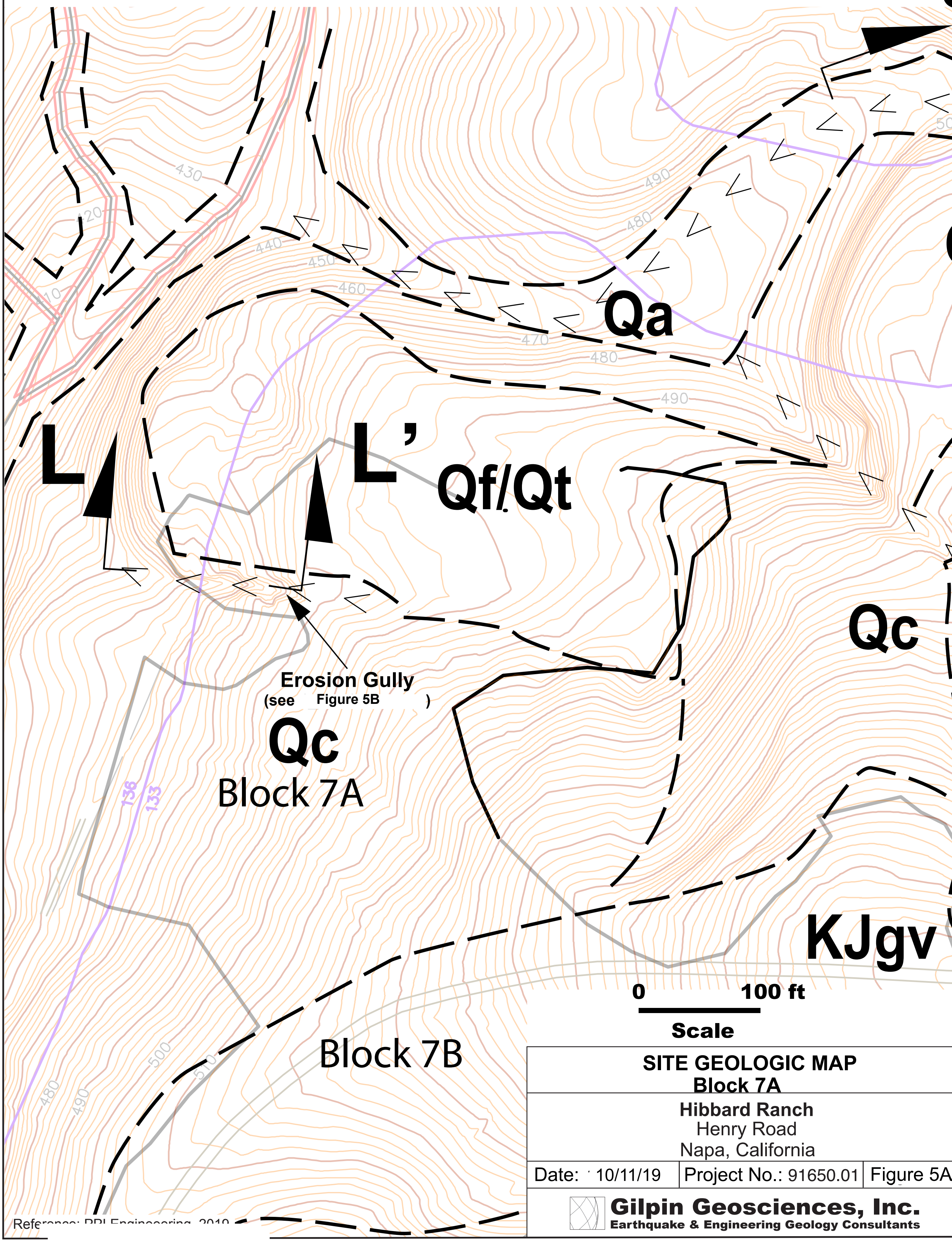
Date: 10/11/19	Project No.: 91650.01	Figure 4B

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants





CROSS SECTIONS N-N' & M-M' Blocks 5 & 6C		
Hibbard Ranch Henry Road Napa, California		
Date: 10/11/19	Project No.: 91650.01	Figure 4C
Gilpin Geosciences, Inc. **Earthquake & Engineering Geology Consultants**		

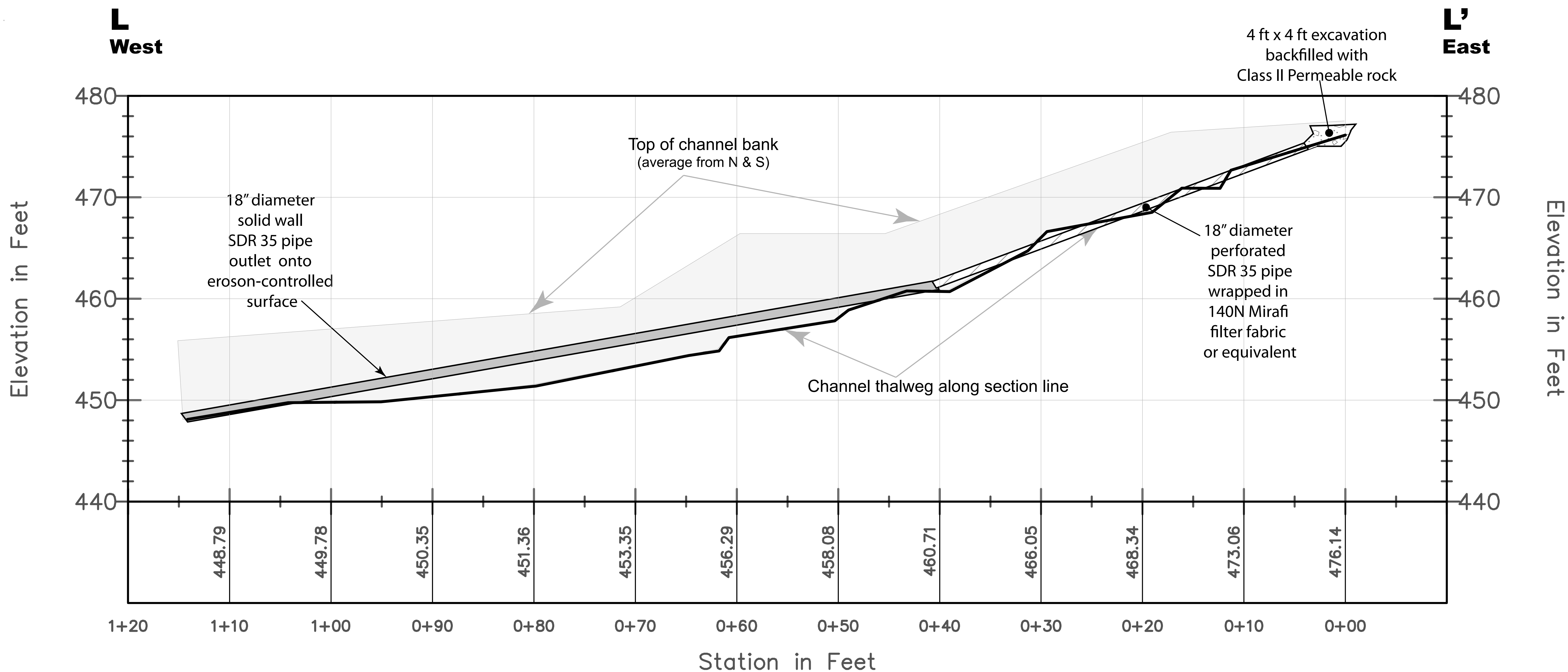


SITE GEOLOGIC MAP
Block 7A

Hibbard Ranch
Henry Road
Napa, California

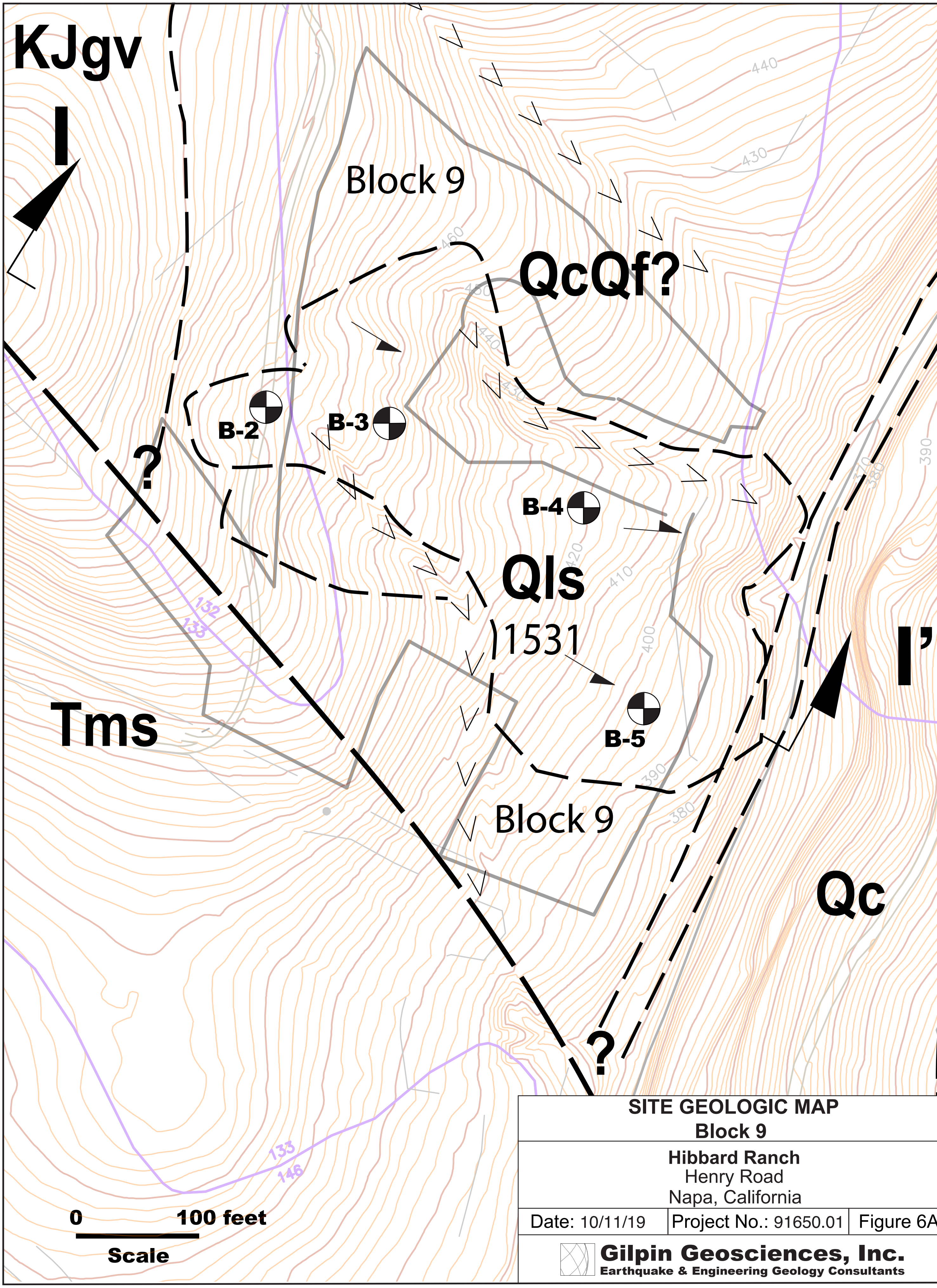
Date: 10/11/19	Project No.: 91650.01	Figure 5A

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants



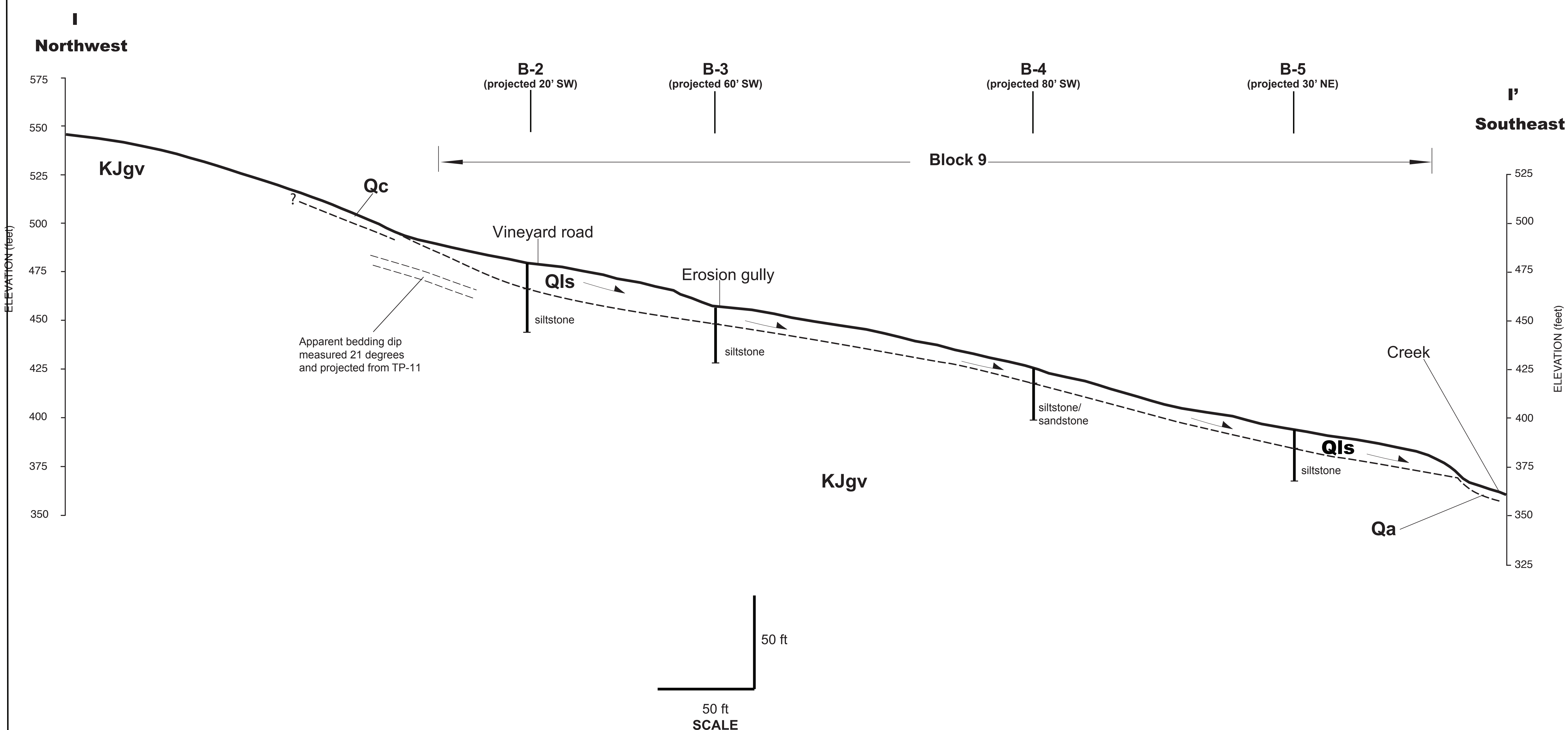
Constuction Sequence:
1. rough grade channel to fit pipe
2. place 18"-diameter pipe
3. excavate and place
Class II permeable material
at top of pipe
4. cover pipe and restore natural ground surface

CROSS SECTION L - L' Block 7A		
Hibbard Ranch Henry Road Napa, California		
Date 1/24/20	Project No. 91650.01	Figure 5B
Gilpin Geosciences, Inc. Earthquake & Engineering Geology Consultants		



SITE GEOLOGIC MAP Block 9		
Hibbard Ranch Henry Road Napa, California		
Date: 10/11/19	Project No.: 91650.01	Figure 6A

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

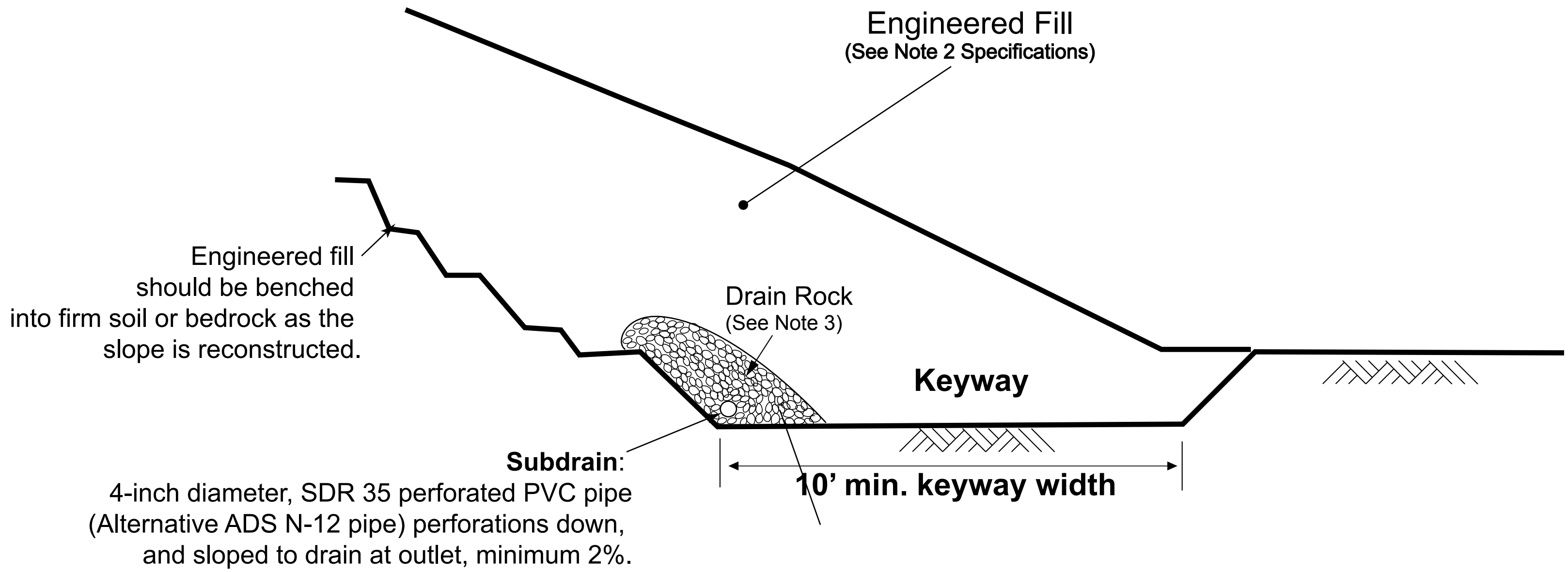


CROSS SECTION
I - I'
Block 9

Hibbard Ranch
Henry Road
Napa, California

Date 10/11/19	Project No. 91650.01	Figure 6B

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants



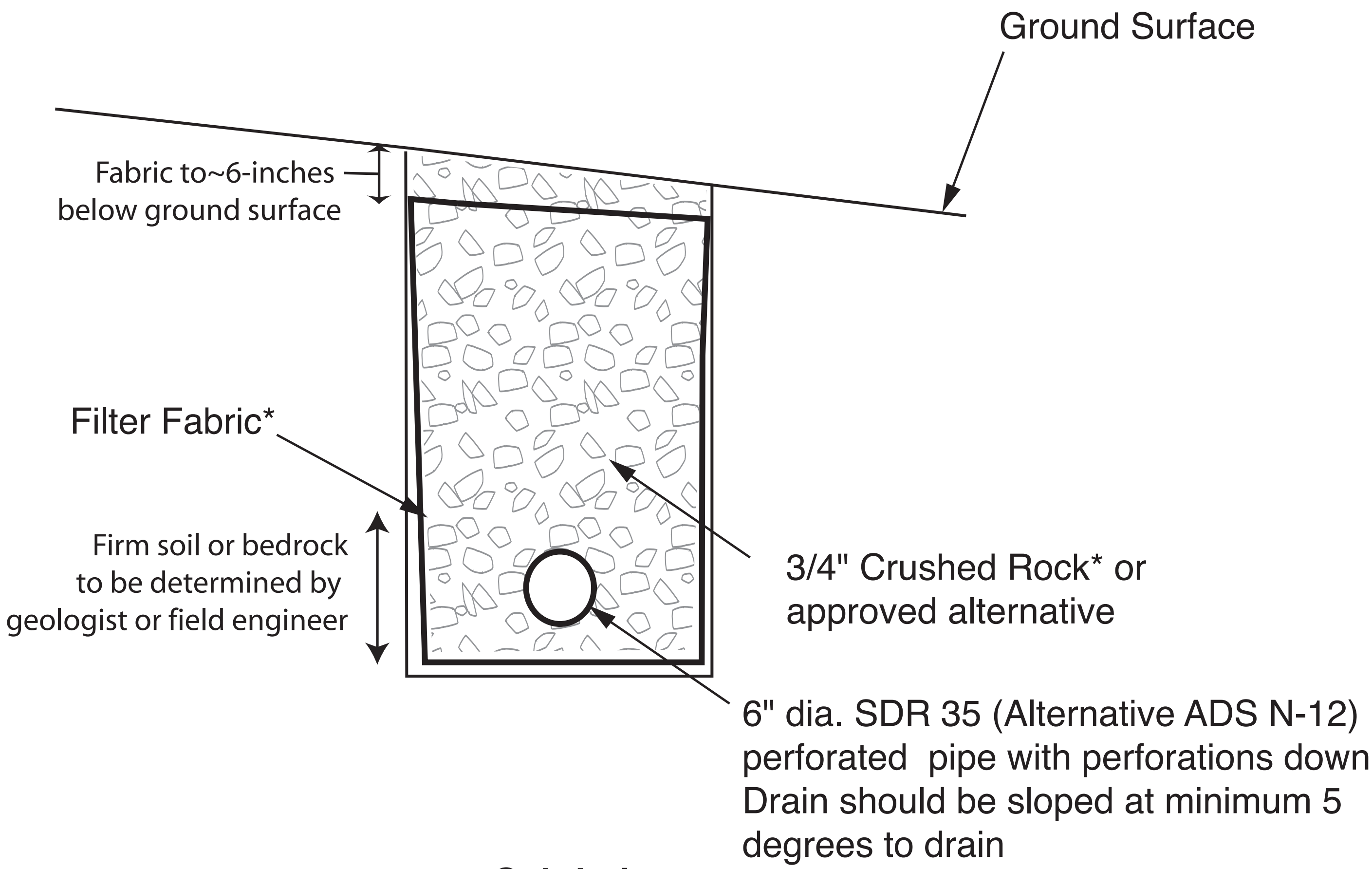
Notes: 1) Keyway should extend 2 feet into firm soil or bedrock as determined by geologist or field engineer.
2) Fill should be placed in 8-inch lifts and compacted to 90% relative density.
3) Additional subdrains may be required where fill is placed against existing slopes.
4) Drain rock should be 3/4-inch clean gravel wrappedin filter fabric (Mirafi 140N or equivalent), or Caltrans Class 2 permeable material

SCHEMATIC EARTH BUTTRESS AND KEYWAY SECTION

Hibbard Ranch
Henry Road
Napa, California

Date 10/11/2019	Project No. 91650.01	Figure 7

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants



Subdrain Detail

Not to Scale

*Note: Caltrans Class 2 permeable aggregate can be substituted for Filter fabric and 3/4" crushed rock.

Subdrain Typical Detail		
Hibbard Ranch **Henry Road** Napa, California		
Date 10/11/19	Project No. 91650.01	Figure 8
Gilpin Geosciences, Inc. **Earthquake & Engineering Geology Consultants**		

APPENDIX A

Logs of Test Borings

PROJECT: **V. Satui Vineyard (Hibbard Ranch)**
Henry Road
Napa, California

Log of Boring B-1

Boring location:	See Figure 2 - Site Plan and Geology Map
Date started:	7/18/19
Date finished:	7/18/19
Drilling method:	CME-55, 4" Solid Flight Auger
Hammer weight/drop:	140 lbs / 30 inches
Hammer type:	Automatic
Sampler:	Modified California 2.43-inch ID, Standard Penetration (SPT)
Logged by:	R.Ford

Ground Surface Elevation: 616 feet[2]

DEPTH (feet)	SAMPLES: Sample Type	SAMPLES: Blows/ foot[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
1–3	SPT	4	CL (af)	SILTY to SANDY CLAY with GRAVEL (CL), yellow to yellowish brown, moist, soft, fine sub-angular sandstone and siltstone gravel (Fill / Landslide Deposit)						
5–10	SPT	3	CL (Qls)	yellow, yellowish orange, olive, moist, very soft, (Landslide Deposit)						
10–14	MC	4	GC (Qls)	CLAYEY GRAVEL with SILT and SAND (GC), olive gray and yellow mottled, moist to wet, very loose, abundant decomposed angular olive brown siltstone gravel (Landslide Deposit)						
15–20	MC	51	si (KJgv)	SILTSTONE, dark gray to olive, yellow oxidation,very thin-bedded, low hardness, weak, moderately weathered, with light gray clay-filled fractures (Great Valley Complex)						
20–25	SPT	77	si/ss	yellow very thinly interbedded sandstone, yellowish red oxidation on joint and bedding surfaces, friable, locally, steeply dipping bedding						
25–26.5	SPT	97		dark gray						

1. Blow counts converted to approximate SPT N-values.
2. Elevation Datum

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

Project No. 91650.01

Figure A-1

Log of Boring B-2

PROJECT: **V. Satui Vineyard (Hibbard Ranch)**
Henry Road
Napa, California

Boring location:	See Figure 2 - Site Plan and Geology Map	Logged by: R.Ford	
Date started:	7/18/19	Date finished:	7/18/19
Drilling method:	CME-55, 4" Solid Flight Auger		
Hammer weight/drop:	140 lbs / 30 inches	Hammer type:	Automatic
Sampler:	Modified California 2.43-inch ID, Standard Penetration (SPT)		

Ground Surface Elevation: 480 feet[2]

DEPTH (feet)	SAMPLES: Sample Type	SAMPLES: Blows/foot[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
1–2	MC	10	ML	SANDY SILT with GRAVEL (ML), yellowish brown, brown, slightly moist to dry, soft, stiff, porous, rootlets (Landslide Deposit)						
4			(Qls)							
5–6	MC	16	CL	SILTY CLAY (CL), dark yellowish brown, moist, very stiff, localized gray clay surrounds sand-size pebbles.						
7–8	SPT	16								
10–11	MC	12	CL-CH	(GC), gray, olive and yellowish brown mottled, with black oxidized blebs, moist, stiff to very stiff, medium plasticity (Landslide Deposit)						
12–13	SPT	12	(Qls)							
15–16	MC	17								
17–18	SPT	16	CL-GC	SILTY CLAY with GRAVEL to CLAYEY GRAVEL (CL-GC), olive brown, to olive yellow, moist, very stiff/medium dense abundant decomposed siltstone gravel/fragments (Landslide Deposit)						
20–21	SPT	12	CL-GC							
23			(Qls)							
25–26	SPT	9	CL-CH	SANDY CLAY (CL-CH) with black layered organic material, wet, soft (Slide Plane)						
27–28	MC	17	si	SILTSTONE, dark gray to olive brown, very thin-bedded, low-hardness, friable to weak, moderately weathered, with light gray clay-filled fractures and polished surfaces (Great Valley Complex)						
28–29	SPT	119	(KJgv)							
30										

1. Blow counts converted to approximate SPT N-values.
2. Elevation Datum

PROJECT: V. Satui Vineyard (Hibbard Ranch) Henry Road Napa, California	**Log of Boring B-2**

Boring location: See Figure 2 - Site Plan and Geology Map		Logged by: R.Ford
Date started: 7/18/19	Date finished: 7/18/19	
Drilling method: CME-55, 4" Solid Flight Auger		
Hammer weight/drop: 140 lbs / 30 inches	Hammer type: Automatic	
Sampler: Modified California 2.43-inch ID, Standard Penetration (SPT)		

DEPTH (feet)	SAMPLES: Sample Type	SAMPLES: Sample	SAMPLES: Blows/ foot[1]	LITHOLOGY	MATERIAL DESCRIPTION Ground Surface Elevation: 480 feet[2]	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
31											
32				(KJgv)							
33	SPT			si	SILTSTONE, dark gray, very thin-bedded, low-hardness, friable to weak, moderately weathered (Great Valley Complex)						
34			49								
35											
36											
37											
38											
39											
40											
41											
12											
43											
44											
45											
46											
47											
48											
49											
50											
51											
52											
53											
54											
55											
56											
57											
58											
59											
60											

1. Blow counts converted to approximate SPT N-values.
2. Elevation Datum

PROJECT: **V. Satui Vineyard (Hibbard Ranch)** Henry Road Napa, California

Log of Boring B-3

Boring location: See Figure 2 - Site Plan and Geology Map

Logged by: R.Ford

Date started: 7/19/19 | Date finished: 7/19/19

Drilling method: CME-55, 4" Solid Flight Auger

Hammer weight/drop: 140 lbs / 30 inches | Hammer type: Automatic

Sampler: Modified California 2.43-inch ID, Standard Penetration (SPT)

LABORATORY TEST DATA

Ground Surface Elevation: 470 feet[2]

DEPTH (feet)	Sample Type	Blows/ foot[1]	LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
4			(Qls)							
5–6	MC	7	CL	SILTY to SANDY CLAY with GRAVEL (CL), yellow to yellowish brown, moist, soft to medium stiff (Landslide Deposit)						
10–11	SPT	6	CL	SILTY to SANDY CLAY with GRAVEL (CL), yellow to brown and gray mottled, with trace black, moist, medium stiff, abundant fine decomposed siltstone gravel (Landslide Deposit)						
13			(Qls)							
15–16	MC	8	GC	CLAYEY GRAVEL with SAND and SILT (GC), olive gray, yellow to olive brown, reddish brown to black oxidation, moist, loose, abundant decomposed siltstone and sandstone (blocks) (Landslide Deposit)						
20–21	SPT	81	si	SILTSTONE, olive gray, yellow to yellowish orange oxidation, very thin-bedded, low-hardness, friable to weak, deeply to moderately weathered (Great Valley Complex)						
24			(KJgv)							
28–30	SPT	26	si	SILTSTONE, gray to dark gray, very thin-bedded, low-hardness, friable to weak, deeply to moderately weathered (Great Valley Complex)						

1. Blow counts converted to approximate SPT N-values.
2. Elevation Datum

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

Project No. 91650.01 | Figure A-3

PROJECT:	V. Satui Vineyard (Hibbard Ranch) Henry Road Napa, California	**Log of Boring B-4**

Boring location: See Figure 2 - Site Plan and Geology Map

Logged by: R.Ford

Date started: 7/19/19 | Date finished: 7/19/19

Drilling method: CME-55, 4" Solid Flight Auger

Hammer weight/drop: 140 lbs / 30 inches | Hammer type: Automatic

Sampler: Modified California 2.43-inch ID, Standard Penetration (SPT)

DEPTH (feet)	SAMPLES: Sample Type	SAMPLES: Sample	SAMPLES: Blows/ foot[1]	LITHOLOGY	MATERIAL DESCRIPTION Ground Surface Elevation: 420 feet[2]	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
1											
2	SPT		7	ML-CL	SANDY SILT to SANDY CLAY (ML-CL), olive gray to dark yellowish brown and yellowish orange mottled, slightly moist, medium stiff (Landslide Deposit)						
3											
4				(Qls)							
5											
6	MC		12	GC	CLAYEY GRAVEL with SAND and SILT (GC), olive gray, yellow to olive brown, reddish brown to black oxidation, moist, loose, abundant decomposed siltstone and sandstone (blocks) (Landslide Deposit)						
7											
8				(Qls)							
9											
10											
11	SPT		12	CL	SANDY CLAY (CL), reddish brown, gray, yellow mottled, moist, medium stiff (Landslide Deposit)						
12				GC	CLAYEY GRAVEL with SAND and SILT (GC), olive gray, yellow to olive brown, reddish brown to black oxidation, moist, loose, abundant decomposed siltstone and sandstone (blocks) (Landslide Deposit)						
13				(Qls)							
14											
15											
16	SPT		25	CL	SILTY CLAY with GRAVEL(CL), yellow to yellowish brown, yellowish orange, moist, stiff to very stiff (Residual Soil)						
17				si	SILTSTONE, olive to dark gray, very thin-bedded, low-hardness, friable to weak, deeply to moderately weathered (Great Valley Complex)						
18				(KJgv)							
19											
20											
21	SPT		33	si	olive, reddish brown to dark brown oxidized, deeply weathered friable, locally, with clay-filled fractures						
22											
23											
24											
25				si							
26	SPT		29	ss	SANDSTONE,yellow to yellowish brown, fine grained, very thin-bedded with gray laminae, low-hardness, friable to weak, deeply to completely weathered, steeply dipping bedding (Great Valley Complex)						
27											
28											
29											
30											

1. Blow counts converted to approximate SPT N-values.
2. Elevation Datum

Log of Boring B-5

PROJECT: **V. Satui Vineyard (Hibbard Ranch)**
Henry Road
Napa, California

Boring location: See Figure 2 - Site Plan and Geology Map	Logged by: R.Ford
Date started: 7/19/19	Date finished: 7/19/19
Drilling method: CME-55, 4" Solid Flight Auger	
Hammer weight/drop: 140 lbs / 30 inches	Hammer type: Automatic
Sampler: Modified California 2.43-inch ID, Standard Penetration (SPT)	

DEPTH (feet)	Sample Type	Blows/ foot[1]	LITHOLOGY	MATERIAL DESCRIPTION (Ground Surface Elevation: 396 feet[2])	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
1–2	SPT	13	CL	SANDY CLAY (CL), dark yellowish brown and yellowish orange and gray mottled, slightly moist, stiff (Colluvium / landslide)						
4			(Qc/ Qa)							
5–6	MC	25	CL	very stiff, moist, decomposed sandstone gravel						
10–11	SPT	22	SC	CLAYEY SAND (SC), gray, with pervasive yellowish orange and dark yellowish brown oxidation, moist, medium dense, fine to medium grained sand, occasional black coarse sand-size fragments (Colluvium/landslide)						
13			(Qc)							
15–16	SPT	21	CL	SILTY to SANDY CLAY (CL), very stiff (Colluvium/landslide)						
20–21	SPT	61	si	SILTSTONE, gray, grayish brown, olive to yellowish brown, very thin-bedded to laminated, low-hardness, friable to weak, near vertical bedding dips, with distinct gray clay-filled fractures, deeply to moderately weathered (Great Valley Complex)						
23			(KJgv)							
25	SPT	50/6	si							

1. Blow counts converted to approximate SPT N-values.
2. Elevation Datum

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		Symbols	Typical Names
Coarse-Grained Soils (more than half of soil> no. 200 sieve size)	**Gravels** (More than half of coarse fraction> no. 4 sieve size)	**GW**	Well-graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorl-graded gravels or gravel-sand mixtures, little of no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	Sands (More than half of coarse fraction< no. 4 sieve size)	**SW**	Well-graded sands or gravelly sands, little or no fines
		SP	Poorly-graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
Fine-Grained Soils (more than half of soil <no. 200 sieve size)	**Silts and Clays** LL = <50	**ML**	Inorganic silts and clayey silts of low plasticity, sandy silts, gravelly silts
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
		OL	Organic silts and organic silt-clays of low plasticity
	Silts and Clays LL = >50	**MH**	Inorganic silts of high plasticity
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic silts and clays of high plasticity
Highly Organic Soils		**PT**	Peat and other highly organic soils

GRAIN SIZE CHART

Classification	Range of Grain Sizes	
	U.S. Standard Sieve Size	**Grain Size in Millimeters**
Boulders	Above 12"	Above 305
Cobbles	12" to 3"	305 to 76.2
Gravel	3" to No.4	76.2 to 4.76
coarse	3" to 3/4"	76.2 to 19.1
fine	3/4" to No. 4	19.1 to 4.76
Sand	No. 4 to No. 200	4.76 to 0.074
coarse	No. 4 to No. 10	4.76 to 2.00
medium	No. 10 to No. 40	2.00 to 0.420
fine	No. 40 to No. 200	0.420 to 0.074
Silt and Clay	Below No. 200	Below 0.074

SAMPLE DESIGNATIONS/SYMBOLS

Sample taken with spit-barrel sampler other than Standard Penetration Test sampler. Darkened are indicated sample obtained

Classification sample taken with Standard Penetration Test sampler

Undisturbed sample taken with thin-walled tube

Disturbed sample

Sampling attempted with no recovery

Core sample

Groundwater level at the time and date indicated

SAMPLER TYPE

C Core barrel

CA California split-barrel sampler with 2-5-inch outside diameter and 1.93-inch inside diameter

D&M Dames & Moore piston sampler using 2.5-inch outside diameter, thin-walled tube

O Osterberg piston sampler using 3.0-inch outside diameter, thin-walled Shelby tube

PT Pitcher tube sampler using 3.0-inch outside diameter, thin-walled Shelby tube

S&H Sprague & Henwood split-barrel sampler with a 3.0-inch outside diameter and a 2.43-inch inside diameter

SPT Standard Penetration Test (SPT) split-barrel sampler with a 2.0-inch outside diameter and a 1.5-inch inside diameter

ST Shelby tube (3.0-inch outside diameter, thin-walled tube) advanced with hydraulic pressure

HIBBARD RANCH
Henry Road
Napa, California

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

SOIL CLASSIFICATION CHART

Date: 8/12/19 | Project No.:91650.02 | Figure A-6

I CONSOLIDATION OF SEDIMENTARY ROCKS: usually determined from unweathered samples. Largely dependent on cementation.

U = unconsolidated
P = poorly consolidated
M = moderately consolidated
W = well consolidated

II BEDDING OF SEDIMENTARY ROCKS

Splitting Property	Thickness	Stratification
Massive	Greater than 4.0 ft.	very thick-bedded
Blocky	2.0 to 4.0 ft.	thick bedded
Slabby	0.2 to 2.0 ft.	thin bedded
Flaggy	0.05 to 0.2 ft.	very thin-bedded
Shaly or platy	0.01 to 0.05 ft.	laminated
Papery	less than 0.01	thinly laminated

III FRACTURING - graphic logs indicate f-fractures and mf-mechanical breaks caused by drilling.

Intensity	Size of Pieces in Feet
Very little fractured	Greater than 4.0
Occasionally fractured	1.0 to 4.0
Moderately fractured	0.5 to 1.0
Closely fractured	0.1 to 0.5
Intensely fractured	0.05 to 0.1
Crushed	Less than 0.05

IV HARDNESS

1. **Soft** - reserved for plastic material alone.
2. **Low hardness** - can be gouged deeply or carve easily with a knife blade.
3. **Moderately hard** - can be readily scratched by a knife blade; scratch leaves a heavy trace of dust and is readily visible after the powder has been blown away.
4. **Hard** - can be scratched with difficulty; scratch produced a little powder and is often faintly visible.
5. **Very hard** - cannot be scratched with knife blade; leaves a metallic streak.

V STRENGTH

1. **Plastic** or very low strength.
2. **Friable** - crumbles easily by rubbing with fingers.
3. **Weak** - an unfractured specimen of such material will crumble under light hammer blows.
4. **Moderately strong** - specimen will withstand a few hammer blows before breaking.
5. **Strong** - specimen will withstand a few heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.
6. **Very strong** - specimen will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.

VI WEATHERING - The physical and chemical disintegration and decomposition of rocks and minerals by natural processes such as oxidation, reduction, hydration, solution, carbonation, and freezing and thawing.

Deep - moderate to complete mineral decomposition; extensive disintegration; deep and thorough discoloration; many fractures, all extensively coated or filled with oxides, carbonates and/or clay or silt.
Moderate - slight change or partial decomposition of minerals; little disintegration; cementation little to unaffected. Moderate to occasionally intense discoloration. Moderately coated fractures.
Little - no megascopic decomposition of minerals; little or no effect on normal cementation. Slight and intermittent, or localized discoloration. Few stains on fracture surfaces.
Fresh - unaffected by weathering agents. No disintegration or discoloration. Fractures usually less numerous than joints.