



**DRAFT MEMORANDUM**

August 31, 2022

To: Mr. Jay Heckenlively  
Real Thorevilos LLC  
Sent via email ([jheckenlively@mcclellanpark.com](mailto:jheckenlively@mcclellanpark.com))

cc: Mr. Jack Bittner  
Bittner and Company  
Sent via email ([jack@bittnerandcompany.com](mailto:jack@bittnerandcompany.com))

Mr. Mike Muelrath  
Applied Civil Engineering, Inc.  
Sent via email ([mike@appliedcivil.com](mailto:mike@appliedcivil.com))

Job No. 677-NPA02

From: Anthony Hicke, PG, CHG  
Richard C. Slade & Associates LLC (RCS)

Re: Preparation of Napa County Tier 3 Water Availability Analysis (WAA)  
Real Thorevilos/Mund Road Vineyards Property  
320 Mund Road  
Deer Park Area, Napa County, California

Dear Mr. Heckenlively:

Richard C. Slade & Associates LLC, Consulting Groundwater Geologists (RCS), is pleased to present this Memorandum regarding a Tier 3 Water Availability Analysis for the for the proposed new vineyard development at the Real Thorevilos/Mund Road Vineyards property in the Deer Park area of , Napa County (County), California. RCS previously prepared a document titled "Results of Napa County Tier 1 Water Availability Analysis, Real Thorevilos/Mund Road Vineyards Property, 320 Mund Road, Deer Park Area, Napa County, California," dated June 24, 2022 (RCS, 2022). That document was submitted to the County as part of the review process for the proposed vineyard development project. Following Napa County review of the application, an email was received by the applicant from the Napa County Planning, Building, & Environmental Services (PBES) Department on July 26, 2022. Therein, a Tier 3 WAA analysis was requested by the County for the subject property. As quoted from the County's July 26, 2022, email:



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*“Regarding Real Thorevilos Vineyard #P21-00170-ECPA – Given the project well’s proximity to a Significant Stream (Cañon Creek), a Tier 3 analysis is required. Please send in a revised WAA or addendum to include the Tier 3 analysis.”*

Therefore, the purpose of this Memorandum is to respond to the Napa County PBES comment above for a Tier 3 analysis, in accordance with the Napa County WAA guidelines (WAA, 2015).

### **Background**

Recently, Napa County has published information defining which Rivers, Streams, and Creeks within the County are considered “significant” for the purposes of Tier 3 Analysis. These “Significant Streams,” as defined by Napa County, are shown on a recently published, undated map titled “Napa County Well Permit Standards: Significant Streams”. Napa County has made available two GIS layers from the map: “Significant\_Streams” and “Significant\_Streams\_1500ft\_Buffer”. These two layers were used by RCS to determine if there are any streams of significance on the subject property, and if any of the project wells are within 1,500 feet of a Significant Stream. According to the County’s WAA Guidelines (WAA, 2015), if a project well lies within 1,500 ft of a Significant Stream, Creek, or River, then a Tier 3 WAA is required.

Figure 1, “Location Map”. shows the subject property boundaries superimposed on the topographic map of the of the area. This is the same Figure 1 included with the original RCS WAA (RSC, 2022), but added to this current map are the “Significant Streams” defined by Napa County, and the associated 1,500-foot buffer zones associated with each stream. As shown on Figure 1, intermittent Cañon Creek is shown to exist within the boundaries of the subject property, and to be within 1,500 ft of both the Well 1-2020, and the Vineyard Well. Based on the elevation data on the topographic map, when surface water runoff flow does exist in the channel, Cañon Creek flows to the northwest where it eventually joins with Bell Creek.

Figure 2, “Aerial Photograph Map”, is the same Figure 2 included in the original WAA submitted for the project (RCS, 2022), and shows an aerial photograph of the area and the same information as was shown on Figure 1, with the “Significant Streams” data added.

### **Creek Flow Observations**

RCS was able to recover only limited information related to historic surface water flows in the Cañon Creek. In a document titled “Central Napa River Watershed Project, Salmonid Habitat Form and Function” (NCRCD, 2005), surveys of Cañon Creek were made by others in July, August and September of 2004. Those surveys noted that Cañon Creek was “completely dry” 0.2 miles upstream of the confluence of Cañon Creek with Bell Creek. The subject property is roughly 1.3 miles upstream of the confluence of Cañon Creek with Bell Creek.

During a site visit to the property in February 2019, an RCS geologist noted that Cañon Creek was dry at the location shown on Figure 2. That location is well within the subject property, and is roughly 2.2 miles upstream of the confluence of Cañon Creek with Bell Creek. Further, the



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property owner noted that the portion of Cañon Creek in the vicinity of the subject property only flows following rain events, which typically occur between October and April of each year; the creek is reported to be dry during the summer months of each year.

### **Well Construction and Hydrogeology**

As stated in the WAA report (RCS, 2022), Well 1-2020 is the project well and will be used in the future to meet the onsite water demands of the existing and the proposed new vineyards, whereas the Vineyard Well will be used in the future as redundant and/or emergency backup well only. Well 1-2020 well has a deep cement sanitary seal set to a depth of 55 ft below ground surface (ft bgs), and four deep perforated intervals (from 279 ft to 379 ft bgs; 399-499 ft bgs; 519 ft to 559 ft bgs; and 659 ft to 689 ft bgs). Figure 3, "Geology Map," is the same geology map shown in the RCS-prepared WAA (RCS, 2022), and it shows that the ground surface at and beneath the subject property and surrounding areas are comprised solely by the various volcanic rocks and ash-flow tuffs assigned to the Sonoma Volcanics. Figure 3 has also been updated with the "Significant Stream" information published by Napa County.

In addition, Figure 3 shows the alignment of a geologic cross section created by RCS for the purposes of this Tier 3 analysis. The cross section is shown on Figure 4, "Cross Sections A-A'". The cross section alignment was chosen to intersect the project well (Well 1-2020) and the intermittent Cañon Creek. The Figure 4 cross section is a scaled drawing, and shows the interpreted geologic conditions beneath the property and key construction data for both Well 1-2020 and the Vineyard Well. Recall from the RCS WAA (RCS, 2022) that the actual construction details of the Vineyard Well were uncertain, and therefore, the details for this well shown on Figure 4 are queried. The section is notated with the surface features intercepted by the cross section, including intermittent Cañon Creek and the subject property lines. Also shown on the cross section is a water level depth measurement of 233.2 ft bgs previously collected in Well 1-2020 during a June 2, 2020, site visit to the property by RCS geologists, and a February 2019 water level measurement in the Vineyard Well, also collected by RCS geologists.

Notable on the cross section are depths of the perforated intervals in Well 1-2020 and the queried perf intervals and depths of the Vineyard Well in relation to ground surface. Perforations in the Well 1-2020 begin at a depth of 279 ft bgs. Perforations in the Vineyard Well are estimated to begin at a depth of 100 ft bgs. . Hence, groundwater pumped from either well will have originated from the fractures and/or pore spaces in the volcanic earth materials at and below those depths. Also, Well 1-2020 and the Vineyard Well were constructed with 55-foot deep and 20-foot deep cement sanitary seals, respectively. These cement seals prevent surficial water (if any) from entering the upper portions of these wells.

Also important to note from the cross sections is the elevation of the water level in the wells in relation to the elevation of the thalweg (or bottom) of Cañon Creek. The water levels from June 2020 and February 2019 in Well 1-2020 and the Vineyard Well, respectively, are at elevations that are hundreds of feet below the intermittent Cañon Creek channel. This significant elevation difference between the water level elevations in the wells and the surfaces of the stream channels is significant evidence to support the assertion that the wells are not hydraulically connected to intermittent Cañon Creek, whether it is flowing or not.



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Based on the data above, and as illustrated on the cross section, Well 1-2022 and the Vineyard Well are not hydraulically connected to intermittent Cañon Creek that exists in the vicinity of the subject property. As shown on the Figure F-2 “Decision Tree” in the County’s WAA Guidance Document (WAA, 2015), and described in the Guidance Document text, and because the onsite wells are not hydraulically connected to surface water(s), the “Groundwater/Surface Water Evaluation is complete.”

### **Conclusions**

- Neither Well 1-2002 (the project well) nor the Vineyard Well (an emergency backup well) are in direct hydraulic connection with intermittent Cañon Creek shown on Figures 1, 2, 3, and 4. This lack of connection is demonstrated by the following:
  - Well 1-2020 has a deep cement seal (55 ft bgs) and perforated intervals that begin at a depth of 279 ft bgs. The Vineyard Well 2020 has a deep cement seal (20 ft bgs) and perforated intervals that begin at an estimated depth of 100 ft bgs. Hence, these wells derive groundwater solely from fractures and/or pore spaces within the Sonoma Volcanics that were encountered in the boreholes for the wells.
  - The water levels in the project well (Well 1-2020) and in the emergency backup well (the Vineyard Well) are currently and have always been at much lower elevations than the elevation of the thalweg, or bottom, of the intermittent Cañon Creek in the vicinity of the subject property.
  - Observations by RCS, reports by the property owner, and data from an NCRCD (2005) report all suggest that intermittent Cañon Creek is typically dry during a portion of the year in the vicinity of the subject property. It is therefore likely that surficial flow in the intermittent Cañon Creek in the vicinity of the subject property is dependent upon rainfall events, and is not fed by groundwater.
- Because a lack of hydraulic connection has been demonstrated, then according to the WAA Guidance document (WAA, 2015), the Tier 3 analysis has been satisfied.



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**References:**

Napa County Board of Supervisors, "Water Availability Analysis (WAA) – Guidance Document." Adopted May 12, 2015

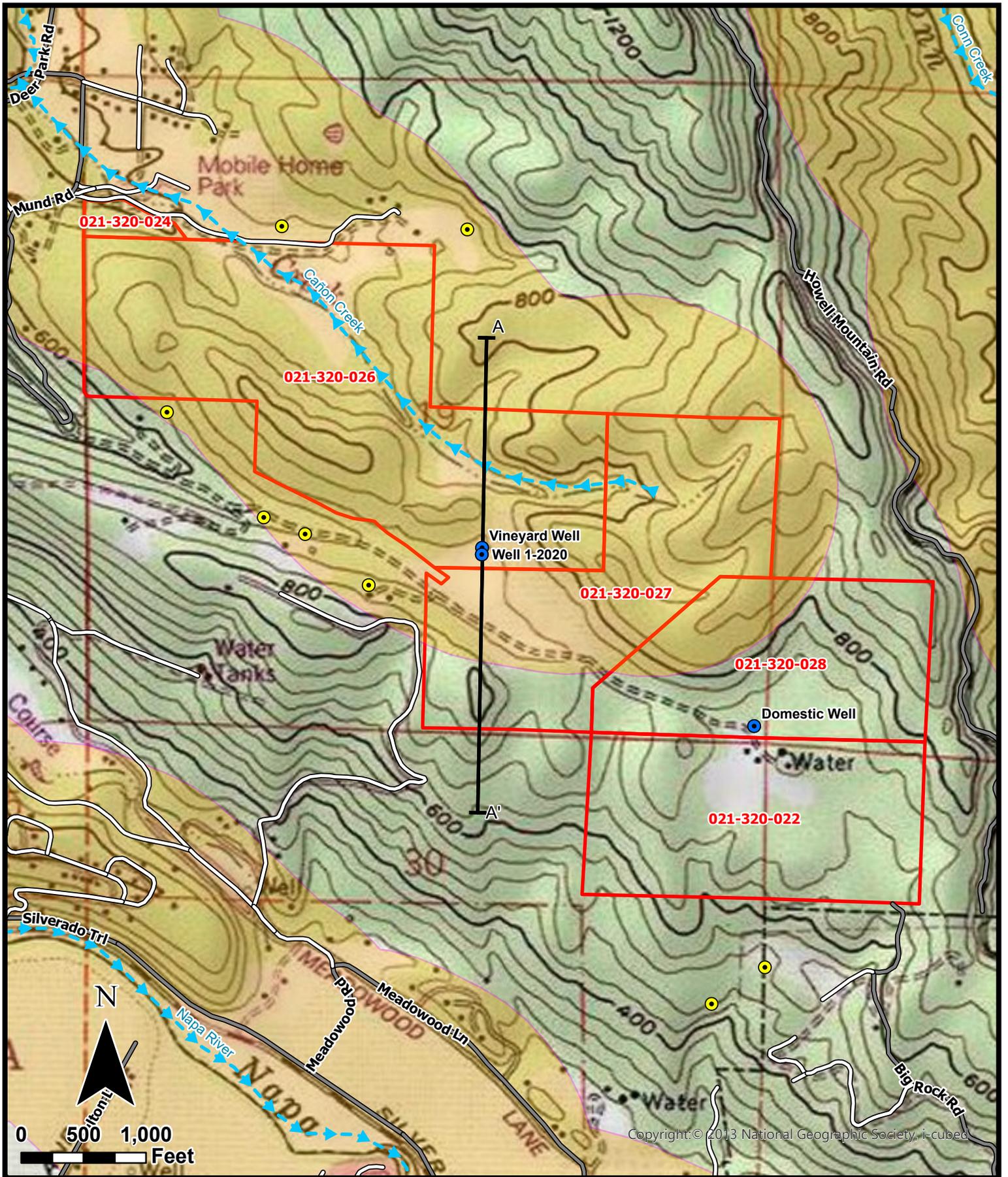
Napa County GIS Data, "Significant\_Streams\_1500ft\_Buffer" data layer, ARC GIS Online Data Catalog (<https://www.arcgis.com/home/item.html?id=8f3927797b6f490c89a8b07778dfed6f>), July 6, 2022.

Napa County GIS Data, "Significant\_Streams" data layer, ARC GIS Online Data Catalog (<https://www.arcgis.com/home/item.html?id=3e3a0f5a59f147e1ae99723f8420f096>), July 27, 2022.

Napa County Groundwater Sustainability Website (<https://www.countyofnapa.org/3074/Groundwater-Sustainability>), "Figure 1, Napa County Well Permit Standards: Significant Streams", undated.  
(<https://www.countyofnapa.org/DocumentCenter/View/25902/Figure-1-Significant-Streams-for-Tier-3>)

Napa County Resource Conservation District (NCRCD), "Central Napa River Watershed Project", Prepared for the U.S. Department of Fish and Game. October 5, 2005.

Richard C. Slade & Associates LLC (RCS), "Results of Napa County Tier 1 Water Availability Analysis, Red Dirt Grapes Vineyard Development Project, Napa County APNs 032-560-038 & 032-030-071, Vicinity Pritchard Hill, Napa County, California". March 17, 2022.



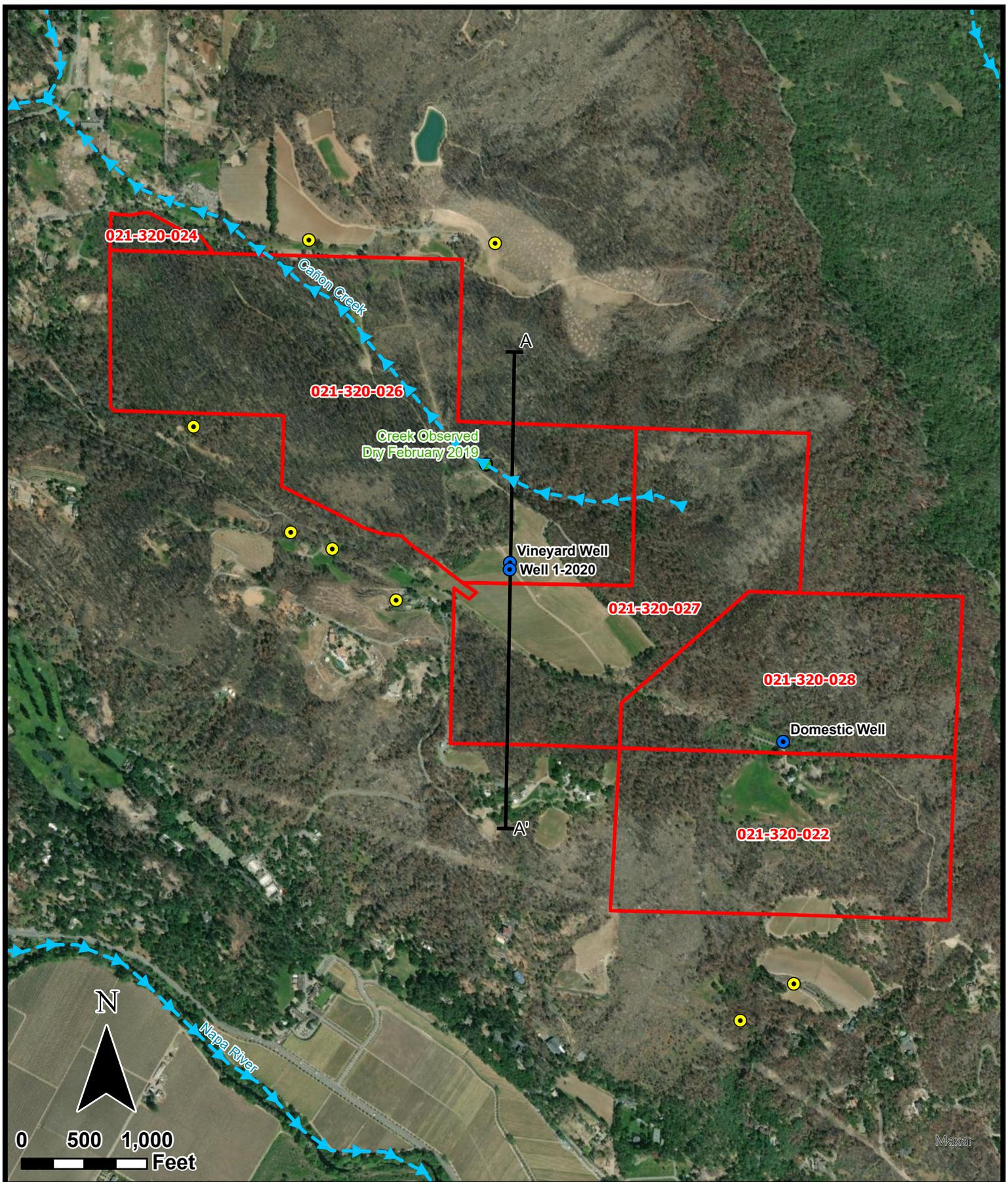
**LEGEND**

- ▭ Subject Property Parcel Boundaries
- ▬ Significant Intermittent Creek, Defined by Napa County
- Onsite Well Location
- ▭ Significant Creek 1500-foot Buffer Zone, Defined by Napa County
- Offsite Well Location (approximate)
- H** Cross Section



**FIGURE 1  
LOCATION MAP  
REAL THOREVILOS/MUND ROAD  
VINEYARDS**

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- LEGEND**
- ▭ Subject Property Parcel Boundaries
  - Location of Onsite Well
  - Offsite Well Location (approximate)
  - H Cross Section
  - - - Significant Intermittent Creek, Defined by Napa County



**FIGURE 2** **DRAFT**  
**AERIAL PHOTOGRAPH MAP**  
**REAL THOREVILOS/MUND ROAD**  
**VINEYARDS**

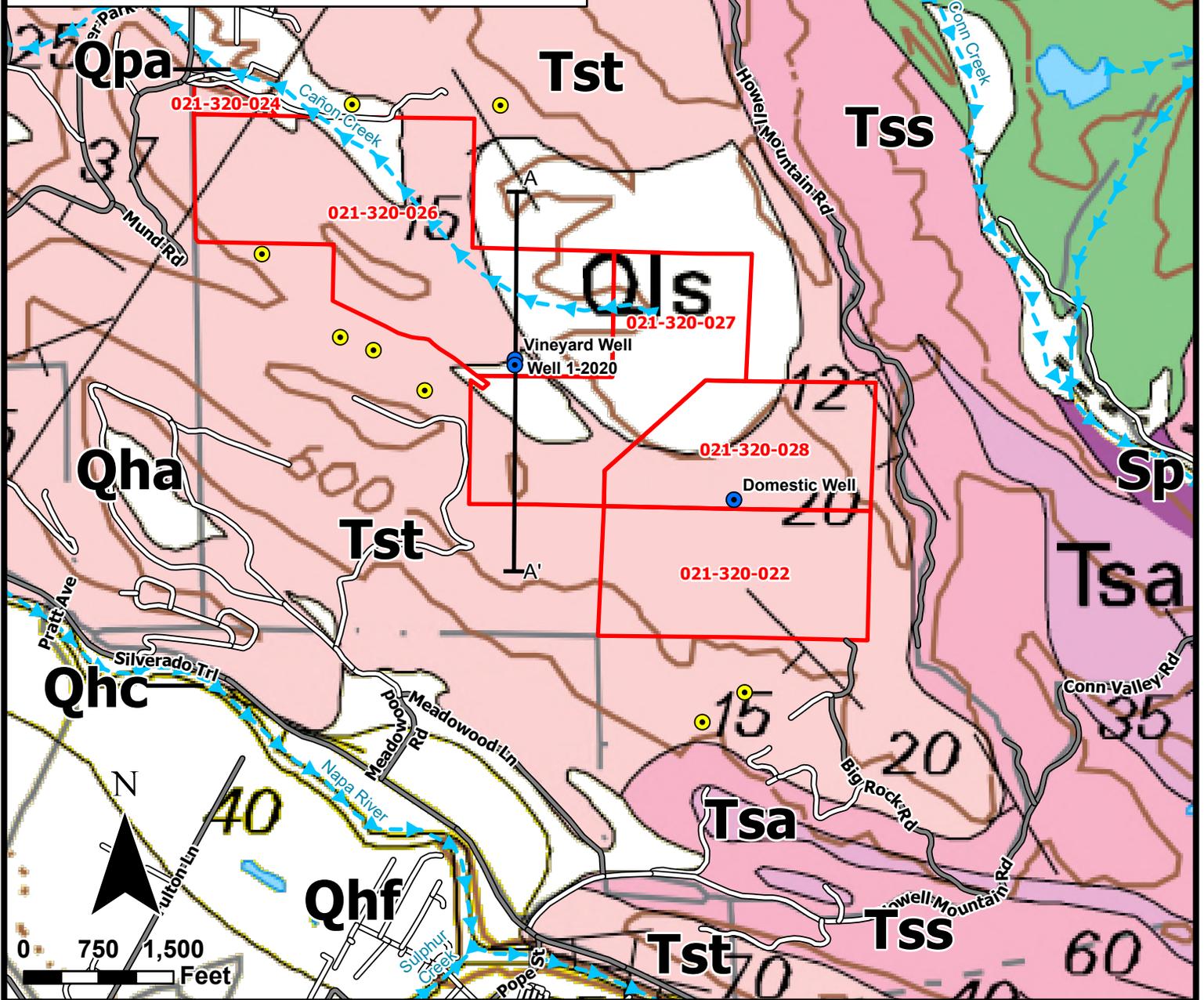
## Geologic Descriptions

Qhc - Stream channel deposits  
 Qhf - Alluvial fan deposits  
 Qha - Alluvium deposits, undivided (Holocene)  
 Qls - Landslide deposits (Holocene and late Pleistocene)  
 Qpa - Alluvium (late Pleistocene)

Sonoma Volcanics (Tertiary)  
 Tsr - Rhyolite flows  
 Tsa - Andesite to basalt lava flows  
 Tst - Pumiceous ash-flow tuff  
 Tss - Volcanic sand and gravel

Great Valley Sequence  
 KJgv - Sandstone, shale, and conglomerate (Late Cretaceous to Late Jurassic)

Reference:  
 Geologic Map and Map Database of Eastern Sonoma and Western Napa



### LEGEND

- ▭ Subject Property Parcel Boundaries
- Onsite Well Location
- Offsite Well Location (approximate)
- H Cross Section
- Significant Intermittent Creek, Defined by Napa County



**FIGURE 3**  
**GEOLOGIC MAP**  
**REAL THOREVILOS/MUND ROAD**  
**VINEYARDS**

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