



MEMORANDUM

April 30, 2015

To: Mr. Jack Locey, P.E., President
Brejle & Race Consulting Engineers (BRCE)
425 South E Street
Santa Rosa, California 95404

From: Anthony Hicke and Richard C. Slade
Richard C. Slade & Associates LLC

Re: Response to March 30, 2015 Letter from
Mr. Allen J. Braga, Owner of Well Adjacent to Erbst Well
Valley Ford, Sonoma County, California

Job No. 154-SNM06

Ref: Recommendations for Final Pumping Rate and
Depth Setting for New Permanent Pump
Erbst Well, Valley Ford, California
April 11, 2015

The purpose of this Memorandum is to discuss the concerns expressed by Mr. Alan J. Braga in his letter received by the County of Sonoma regarding the proposed use of the Erbst Well as a source of water for the Valley Ford Water Association (VFVA). A copy of the March 30, 2015 letter from Mr. Braga is attached to this Memorandum. In his letter, Mr. Braga provides the Assessor's Parcel Numbers (APNs) for his three properties that are adjacent to the Erbst property. Further, he states that there are two "shallow wells" on his properties, although the exact locations and depths of the wells are not provided. The letter does mention that one of his offsite wells is approximately 110 yards (330 ft) from the Erbst Well.

In a subsequent telephone conversation with Mr. Braga, Mr. Jack Locey of BRCE was reportedly able to determine the locations of the two Braga-owned wells. Mr. Locey then provided a separate map to RCS with those locations highlighted. Figure 1, "Well Location Map," shows the locations of the Braga wells as relayed to us by Mr. Locey, and also shows the property boundaries of the Braga property, as determined using the APNs listed in Mr. Braga's letter and the freely available GIS data for the Sonoma County Parcel map. It is unknown to RCS why the Braga Residential Well is located outside of the boundaries of the APNs listed in Mr. Braga's letter. Also note that the location of the Braga Irrigation Well is consistent with the approximate 110-yard (330-foot) offset from the Erbst Well, as mentioned in Mr. Braga's letter. Based on the well location provided by Mr. Locey, the Braga Residential well is located approximately 2,600 ft northwest of the Erbst Well.

Figure 2, "Geologic Map," has been adapted from geologic field mapping by others, as originally published by the California Geological Survey (CGS). As shown on Figure 2, the "shallow" Braga Irrigation well is shown to have been dug in an area geologically mapped as "alluvium"



(map unit "Qha), whereas the more distant Braga Residential well is shown to have been dug directly in the Wilson Grove Formation (map unit "Twg"), but on the opposite side (i.e., on the west side) of the alluvium along Ebabias Creek from the Erbst Well. In comparison, the subject Erbst Well was drilled and constructed directly into the Wilson Grove Formation, in the hillsides on the east side of the alluvium along Ebabias Creek, as shown on Figure 2.

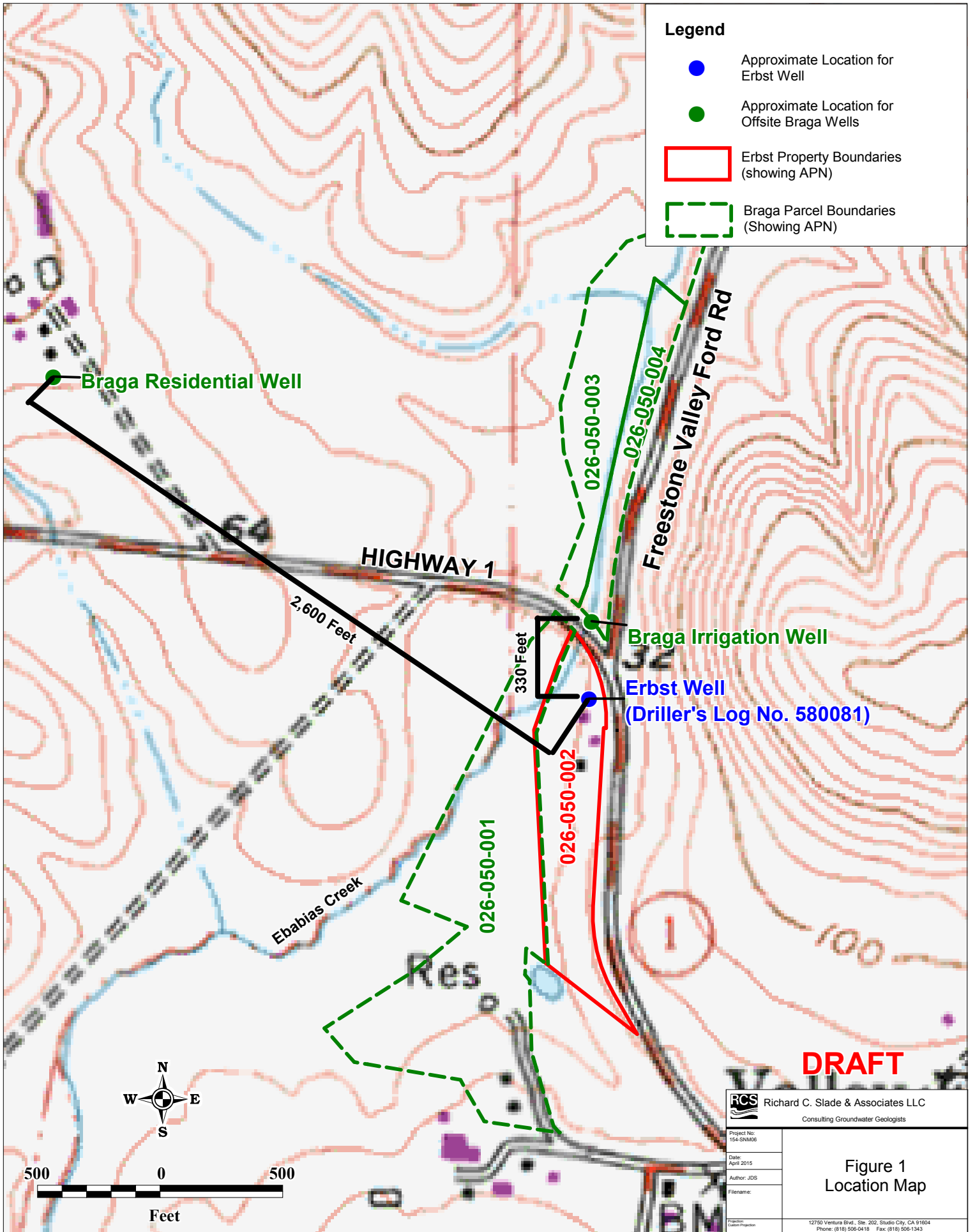
Approximate ground surface elevations of each of the wells were estimated using the Google Earth Pro software package, as follows: Erbst Well elevation \approx 24 ft above mean sea level (amsl); Braga Irrigation Well \approx 20 ft amsl; Braga Residential Well \approx 83 ft amsl.

Unfortunately, no specific well construction data were provided by Mr. Braga in his letter, other than reporting that the wells were "shallow". As reported to RCS by Mr. Locey, a follow-up conversation between Mr. Braga and Mr. Locey that took place on April 22, 2015 revealed that both of the wells in questions were hand-dug roughly 50 to 80 years ago. Thus, the wells are reported to be no more than 30 ft in depth each; both have diameters of roughly 3 to 4 feet. Unfortunately, no water level data were provided for either well by Mr. Braga.

Based on those reported depths of 30 ft for each well, coupled with the local ground surface elevations estimated above, the elevation of the bottom of the Braga Irrigation Well and the Braga Residential Well are calculated to be -10 ft below mean seal level (bmsl) and 53 ft amsl, respectively. In comparison, the Erbst Well is constructed such that the perforated interval in this well lies between the elevations of -266 ft bmsl and -236 ft bmsl. Therefore, the reported bottom of the Braga Irrigation well is 226 ft higher in elevation than the top of the uppermost perforated interval in the Erbst Well. Similarly, the bottom of the Braga Residential Well is higher in elevation than the perforated intervals in the Erbst well by 289 ft.

Based on the limited available data provided for the Braga wells, pumping of the Erbst well for use by the VFWA at the rates and durations described in our April 11, 2015 Revised Draft Memorandum will not likely affect either of the Braga wells, for the reasons described below:

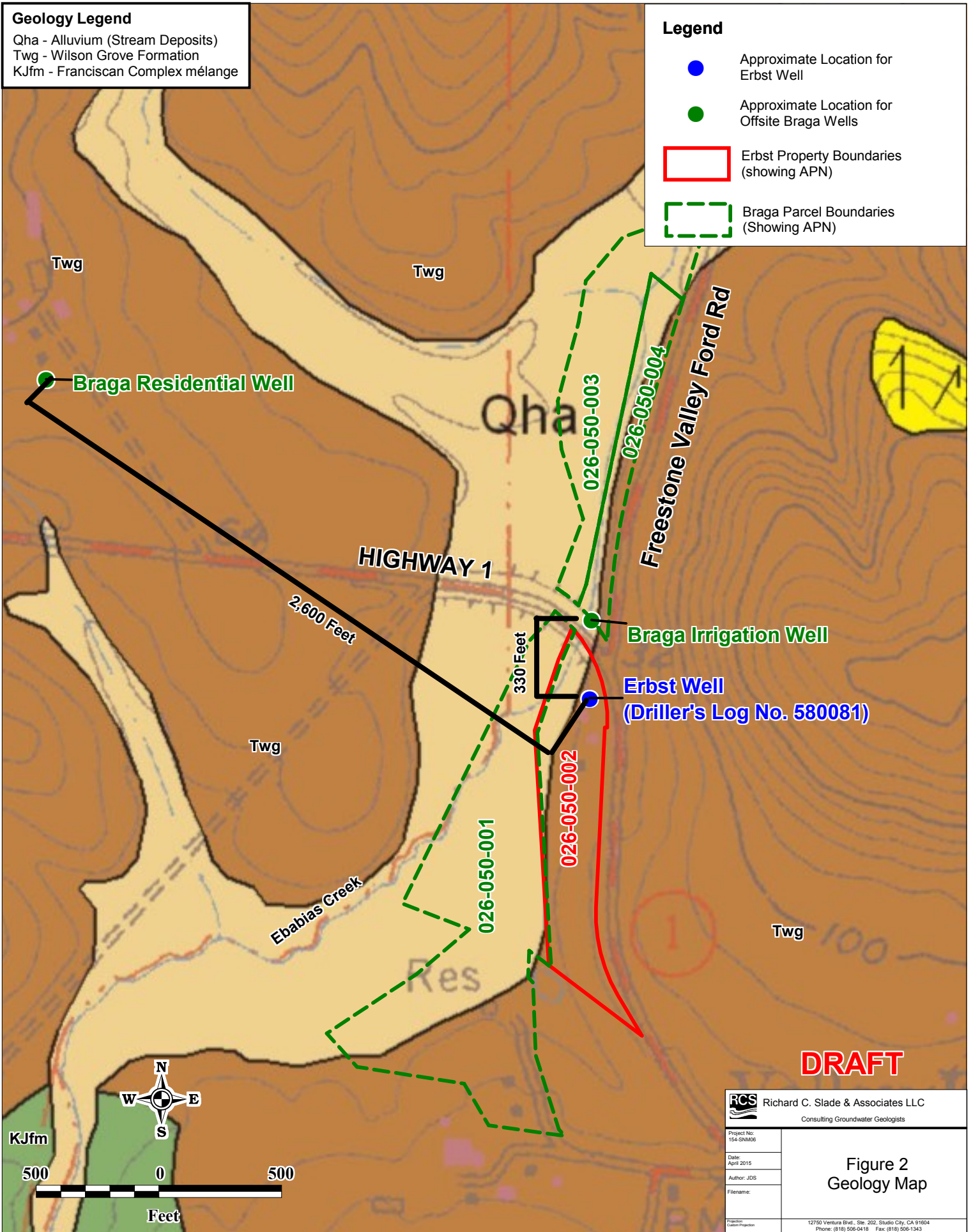
- The shallow Braga Irrigation well, which is located roughly 330 ft north of the Erbst Well, is considered to derive the majority of its water from the relatively thin, and laterally-limited alluvial deposits into which it was hand-dug. The Erbst well clearly produces water from the deeper portion of the Wilson Grove Formation, and is at an elevation that is 229 ft deeper than the bottom of the Braga Irrigation Well. Based on this elevation difference, and the fact that the Braga Irrigation well derives most of its water from the shallow alluvial deposits, and not the deeper Wilson Grove Formation, the proposed future pumping of the Erbst Well is very unlikely to affect the Braga Irrigation well.
- Located roughly 2,600 ft northwest of the Erbst Well, and in the hillsides on the opposite side of Ebabias Creek, the shallow Braga Residential well produces water at an elevation 289 ft higher than its uppermost perforations within the Wilson Grove Formation in the Erbst Well. Due to the great lateral distance and elevation difference between the Braga Residential well and the Erbst Well, the proposed future pumping of the Erbst Well is very unlikely to affect the Braga Residential well



Geology Legend
 Qha - Alluvium (Stream Deposits)
 Twg - Wilson Grove Formation
 KJfm - Franciscan Complex mélange

Legend

- Approximate Location for Erbst Well
- Approximate Location for Offsite Braga Wells
- Erbst Property Boundaries (showing APN)
- Braga Parcel Boundaries (Showing APN)



DRAFT

Richard C. Slade & Associates LLC Consulting Groundwater Geologists	
Project No: 154-SNM06	<h2>Figure 2</h2> <h3>Geology Map</h3>
Date: April 2015	
Author: JDS	
Filename:	
<small>12750 Ventura Blvd., Ste. 202, Studio City, CA 91604 Phone: (818) 506-0418 Fax: (818) 506-1343</small>	

March 30, 2015

To Whom it May Concern:

RE: Valley Ford Water Association

File PLP 14-0079

My name is Allen Braga. I have three parcels 026-050-001, 026-050-003 and 026-050-004 that border parcel 026-050-002

This property has been owned by my family for nearly a century, has two shallow wells that have supplied the house and animals all of these years.

I don't know where the Valley Ford Water Association is planning on drilling their well, but if they are going to use the existing well on parcel 026-050-002, I have a well 110 yards from it. If they are going to drill a new well, or ever have to, it could be closer to the well that supplies water for my home and my cattle.

There are four businesses and twenty two households (maybe more) that will be using this water. I know we all need water, I am not against that but I need to protect my water rights.

As everyone knows this is going to lower the ground water table in this area. Will the Valley Ford Water Association supply me with water at no charge if my wells fail?

Whoever is in charge of this should have considered other options. The Water Association has a good supply of water where their well is located now, but the nitrates are high. I can't think of a reason why that source of water couldn't be treated to make it safe to use for a lot less expense than what they planning to do.

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In closing please take my concerns into consideration when there are other options.

Sincerely,

Allen J. Braga

P.O. Box 384

Valley Ford, Ca. 94972

707-876-3128