TO: Jason Moriarty

FROM: Kear Groundwater
P.O. Box 2601
Santa Barbara, CA 93120-2601

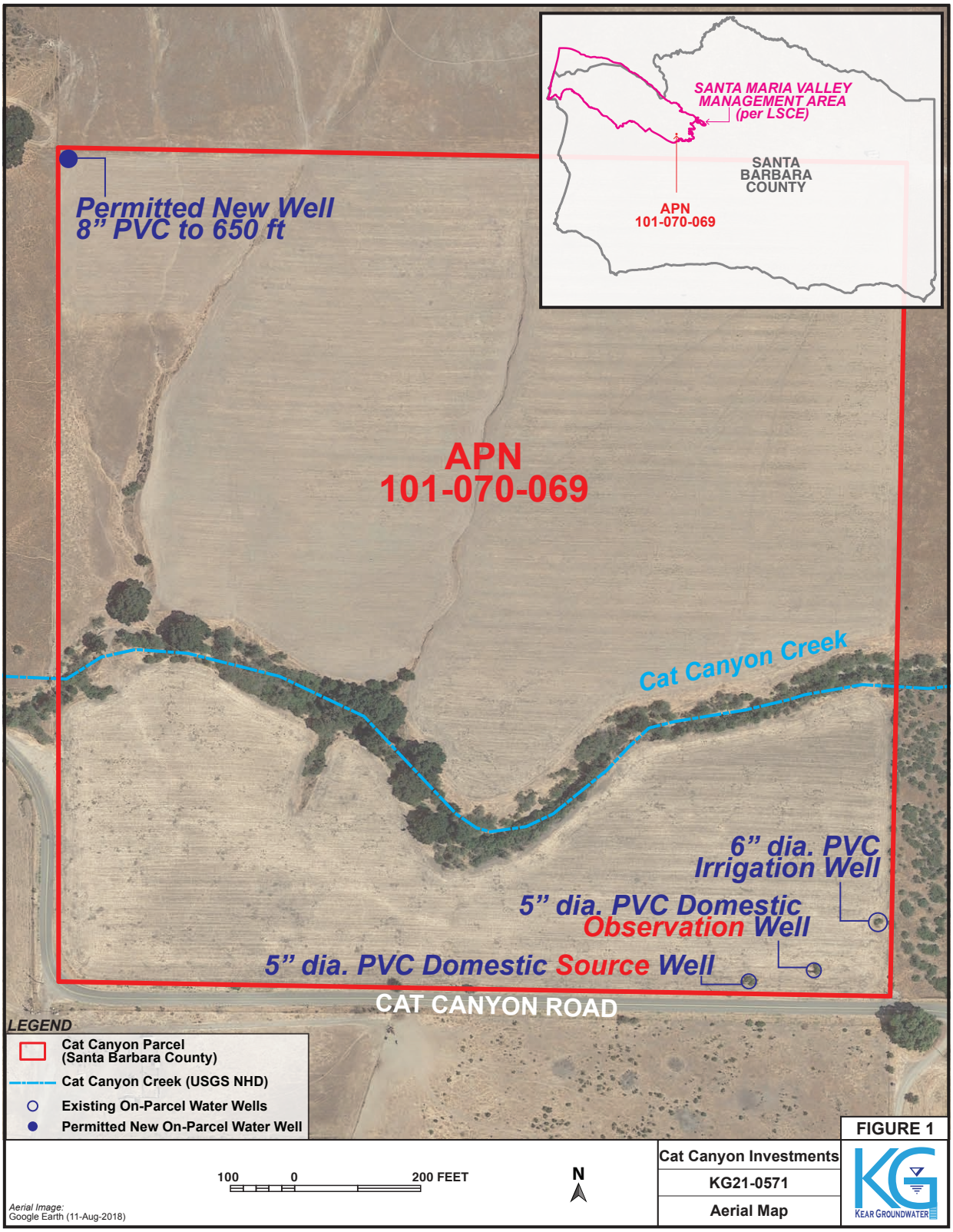
DATE: June 18, 2021

SUBJECT: *Single Parcel Domestic Water System Source Yield Assessment*
40-Acre Agricultural Parcel in Cat Canyon, Santa Barbara County, California

Dear Mr. Moriarty,

Kear Groundwater (KG) presents this letter detailing our recent (April 2021) yield testing of an existing well on the 40-acre Cat Canyon parcel (APN 101-070-069) in northwestern Santa Barbara County, California. This well, or a recently-permitted new well, may be used to serve a future single parcel domestic water system at the property. KG provided our earlier 'Irrigation Suitability Analyses of Groundwater Quality' on April 23, 2021 based on samples collected during a previous shorter-term pump event. Figure 1 presents the well and parcel location map.

As developed by the County's Environmental Health Services (EHS), a Single Parcel Water System (SPWS) must comply with provisions set forth in the County Code of Ordinances, Chapter 34B - Domestic Water Systems. Per Sec. 34B-2, a "domestic water system" serves the domestic purposes of not more than fourteen water connections, including all source, treatment, storage, distribution, monitoring and automation facilities and equipment. A "single-parcel water system" is a type of domestic system that serves one to four residential or commercial water connections, located on a single parcel of land and serving fewer than an average of twenty-five persons for sixty or more days during any part of the year. Per Sec. 34B-16 and -18, a well source that supplies a single-parcel domestic water system must be capable of providing at least three gallons per minute (gpm) on a continuous basis to each connection served. Additionally, per Sec. 34B-21, domestic source water must not exceed maximum containment levels (MCL) established by the Department of Public Health (Title 22, California Code of Regulations) for Inorganic Chemicals and for all Secondary Standards. Finally, the SPWS application also stipulates that the source water meets State bacteriological standards.



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The Cat Canyon property is entirely within the State- delineated Santa Maria River Valley Groundwater Basin ("Santa Maria Basin," Department of Water Resources, Bulletin 118, Basin Number 3-12). Groundwater aquifers in the basin are primarily stored in unconsolidated alluvial deposits and in the older sedimentary formations (most commonly the Paso Robles Formation [not present under the property] and Careaga Sandstone), especially where fractured, contain remnant primary porosity, and/or coarse-grained.

Water rights within the Santa Maria Basin have been adjudicated since 2008, with Luhdorff and Scalmanini, Consulting Engineers (LSCE) serving as the Water Manager/Watermaster. The Superior Court of California, County of Santa Clara, passed down the Stipulation of the Santa Maria Groundwater Basin Litigation in 2005 in order to ensure the Basin's long-term sustainability. LSCE follows a monitoring program as required by the Stipulation that includes assessment of groundwater conditions (levels and quality), land/water use, and quantities utilized.

Specifically, the Cat Canyon property overlies the Santa Maria Valley Management Area (SMVMA), one of three management areas of the larger adjudicated Santa Maria Basin. The 2020 SMVMA annual report by LSCE (2021) lists a total groundwater extraction of 122,908 acre-ft for the year (up from 109,937 acre-ft in 2019), with about 107,745 acre-ft of that total used for agriculture. Groundwater extraction from the SMVMA increased from about 80,000 acre-ft in 1950 to about 150,000 acre-ft by 1990, and has thereafter fluctuated between about 100,000 and 150,000 acre-ft per year (LSCE, 2021).

Single-Parcel Domestic Water System Yield Test at Cat Canyon Parcel (April 2021)

Per Sec. 34B-18, the source yield testing for a single-parcel water system must be performed by a California-licensed water well contractor (C-57), pump contractor (C-61-D21), professional geologist, certified hydrogeologist engineering geologist, or registered civil engineer. For water wells, the minimum yield test pumping rates and periods are 3.0 to 10.0 gpm for 72 hours, >10.0 to 50.0 gpm for 24 hours, or >50.0 gpm for 12 hours.

The Cat Canyon parcel currently has a 6-inch-diameter PVC-cased irrigation well near its southeastern corner, with two 5-inch-diameter PVC-cased apparent domestic wells in close proximity. Filipponi & Thompson Drilling Co. (Filipponi) constructed the two 5-inch-diameter PVC-cased wells, along with two other subsequently abandoned test holes, in 2006. Filipponi labeled the bores as "B-2" through "B-5," presumably because the irrigation well already existed. The western domestic well corresponds to "B-2," with the 5-inch-diameter SDR-21 PVC casing reportedly extending to 140 ft bgs that includes 0.040-inch-aperture slotted perforations from 60 ft to 140 ft. The annulus is filled with gravel pack from 140 ft up to 52 ft, and then a cement sanitary seal from 52 ft up to ground surface. The well yielded 30 gpm during a 2-hour long airlift test in June 2006. The eastern domestic well corresponds to "B-5" and has the same reported construction but yielded 50 gpm during a 1-hour long airlift test in June 2006.

KG initially deployed a submersible test pump into the western 5-inch-diameter PVC well on April 5, 2021, setting the intake at a depth of around 110 ft bgs. KG pumped the western well at about 16 gpm for 60 minutes and collected groundwater quality samples the same day.

On April 14, 2021, KG personnel returned to the property and deployed an automated data logger into the western well to record the water levels and temperatures in one-minute intervals throughout testing and the subsequent recovery. KG also equipped a Keyence ultrasonic flow meter onto the discharge line to record both the total volume pumped (gallons) and the instantaneous pumping rate (gpm). In addition to the automated logger data, KG personnel measured the static, pumping, and recovery water levels with an electric sounder. KG also measured the induced interference via the sounder at the central 5-inch-diameter PVC domestic

well (the closest observation point); the two wells are separated by about 103.5 lateral ft.

KG began the long-term (24+ hours) source yield test at the western well around 1:50PM on April 14, 2021 (Photograph 1, below). Prior to pumping, the static water level in the western well was 66.80 ft bgs; the static water level in the central observation well was 67.16 ft bgs.

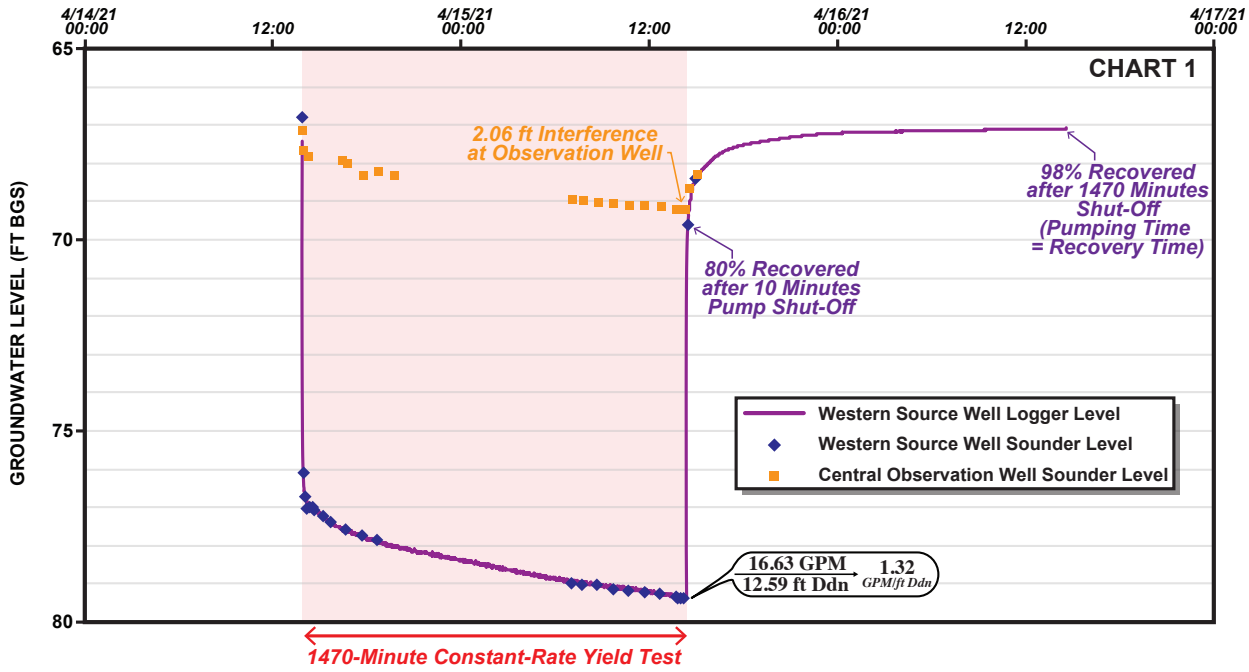
Photograph 1. Source yield testing the western 5-inch-diameter PVC well at APN 101-070-069 (KG, 14-April-2021).

Ultimately, over the 1470-minute pumping period, the western well produced 24,440 total gallons for a long-term average of 16.63 gpm, consistent with the instantaneous rates of between 16.4 to 16.9 gpm throughout testing (Photograph 2). The pumping water level fell to 79.39 ft bgs (12.59 ft drawdown, or a specific capacity of 1.32 gpm per ft ddn). This pumping event at the western well induced 2.06 ft of interference at the central observation well near the end of testing.

Photograph 2. Pumping rate of 16.6 gpm (KG, 14-April-2021).

Following pump shut-off, the water level recovered to about 80% of its static, pre-pumping level after 10 minutes and to about 90% after 75 minutes. When the recovery time equaled the 1470-minute pumping event, the water level recovered to about 98% of its static level. This suggests that the western domestic well at the Cat Canyon parcel can sustain a long-term pumping rate of around its current capacity of 16 gpm.

Chart 1 summarizes the logger levels at the western well alongside the sounder levels at both the western and central wells.



Aquifer Parameters

Local aquifers parameters can be calculated by using Aqtesolv, an aquifer test analysis software, based on the pumping data at the western domestic well and the interference data at the neighboring central domestic well.

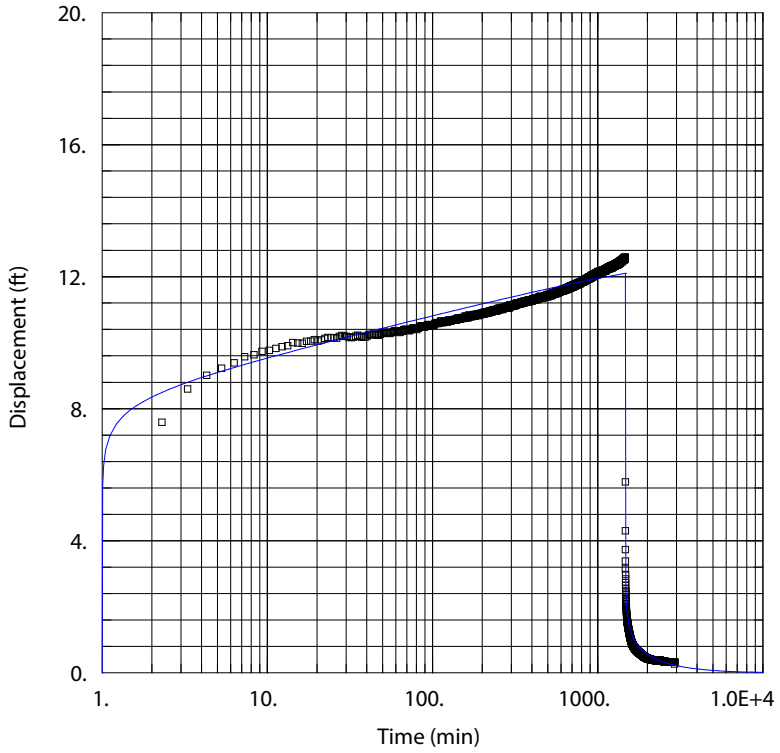
The key aquifer parameters that characterize the hydraulics of groundwater movement include transmissivity, hydraulic conductivity, and storativity. Transmissivity and hydraulic conductivity are related (transmissivity is the product of hydraulic conductivity and aquifer thickness) and characterize the permeability of aquifer materials. Storativity is measure of the aquifer's ability to store and release water (equivalent to specific yield when expressed as a percentage for unconfined aquifers), and is the product of specific storage and aquifer thickness.

Chart 2 presents the Hantush-Jacob solution of the western well drawdown and recovery data. The transmissivity is calculated to be 3534.8 gallons per day (gpd) per ft (gpd/ft), or about 472.5 ft^2/day. This equates to a hydraulic conductivity of 39.3 gpd/ft^2, or about 5.6 ft/day, based on a 90-ft saturated aquifer thickness. Aquifer storativity (unitless) is calculated to be 0.000004649.

Chart 3 presents the Tartakovsky-Neumansolution of the central well's induced interference data. The transmissivity is calculated to be 3777.8 gallons per day (gpd) per ft (gpd/ft), or about 505.0 ft^2/day. This equates to a hydraulic conductivity of 42.0 gpd/ft^2, or about 5.3 ft/day, based on a 90-ft saturated aquifer thickness. Storativity is calculated to be 0.0002547.

These parameters are typical of the semi-consolidated fine sand aquifer system and relative shallow water levels.

CHART 2



WELL TEST ANALYSIS

Data Set: C:\...\Careaga pumping test.aqt
Date: 04/27/21 Time: 14:20:59

PROJECT INFORMATION

Company: KG
Client: Cat Canyon, LLC
Location: Cat canyon
Test Well: Cat Canyon Pumping Well
Test Date: 4/15/21

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Pumping Well	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ Pumping Well	0	0

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 3534.8 gal/day/ft
r/B = 1.0E-5
b = 90. ft

S = 4.649E-6
Kz/Kr = 1.

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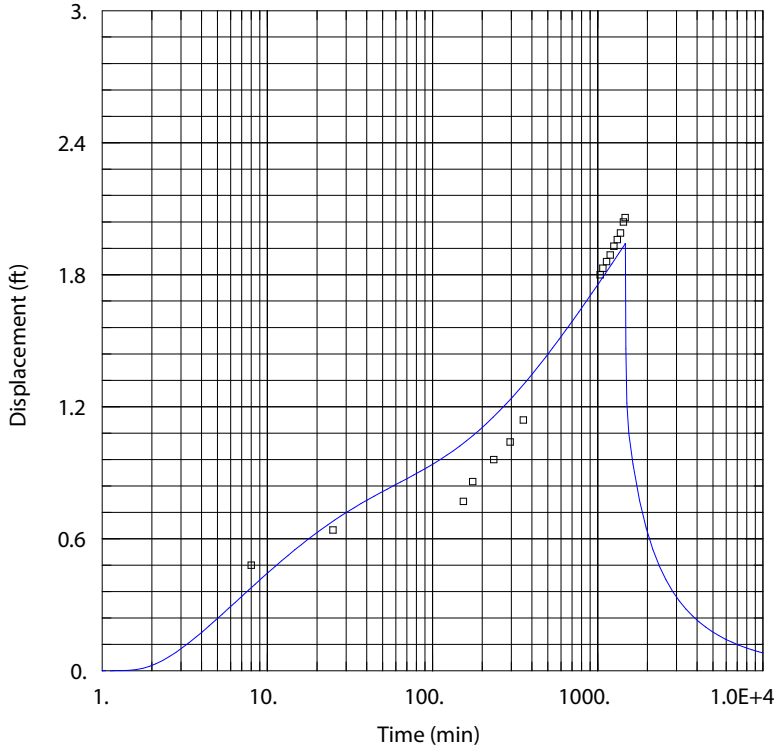
CHART 3



CAREAGA TEST

Data Set:
Date: 04/26/21 Time: 16:57:25

PROJECT INFORMATION

Company: KG
Client: Cat Canyon LLC
Location: Careaga
Test Well: West domestic
Test Date: 4/14/21

AQUIFER DATA

Saturated Thickness: 90. ft Anisotropy Ratio (Kz/Kr): 0.07561

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
West domestic	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Central Domstic	103.5	0

SOLUTION

Aquifer Model: Unconfined Solution Method: Tartakovsky-Neuman

T = 3777.8 gal/day/ft S = 0.0002547
Sy = 0.00213 Kz/Kr = 0.07561
kD = 1000.

Summative Statement

KG finds that the yield of the potential future source well complies with the provisions set forth in the County Code of Ordinances for single-parcel domestic water systems.

Separately, as originally detailed in our 'Hydrogeologic Overview and Groundwater Development Recommendations' on March 8, 2021, a new well has been permitted (WP#4781) in the northwestern corner of the Cat Canyon parcel. The new well will be constructed of a larger diameter (8-inch *vs*. 5-inch) and extend to a greater depth (650 ft [fully through the Careaga Sandstone] *vs*. 140 ft), and thus its future yield will most likely exceed that of the tested well reported herein.

Any storage, treatment or distribution components of the system must be included with the SPWS application. A treatment commitment is also required, signed by the property owner and a representative of the treatment equipment company. Please do not hesitate to contact us with any questions.

Best Regards,

Jordan Kear
Principal Hydrogeologist
Professional Geologist No. 6960
California Certified Hydrogeologist No. 749

Timothy Becker
Professional Geologist No. 9589

REFERENCES

Luhdorff & Scalmanini Consulting Engineers [LSCE] (2021), 2020 Annual Report of Hydrogeologic Conditions, Water Requirements, Supplies and Disposition, Santa Maria Valley Management Area.