“I”

Wastewater Feasibility Study

Caldwell Vineyards Winery P17-00074
Planning Commission Hearing Date January 17, 2018

CMP Civil Engineering & Land Surveying
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Water System Feasibility Report

for the

Caldwell Vineyard Winery

270 Keuzer Lane

Napa, CA 94558

APN: 045-310-055 & 056

Prepared By:

CMP Civil Engineering & Land Surveying

1607 Capell Valley Road

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Date: 1/20/2017

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CAMERON PRIDMORE
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CIVIL
STATE OF CALIFORNIA

Table of Contents

Water System General Descriptions

The proposed water system, officially called the Caldwell Vineyard Winery Water System, will supply potable water to the existing Caldwell Vineyard Winery. There are no existing homes on either of the parcels. The water source for the winery will be an existing onsite well.

Water System Technical Description and Feasibility

The water source for this winery system is an existing well on the southern winery property. The subject source well is located on the general eastern side of the property. See Attachment "A" for a map showing the exact location. The well is currently used to provide potable water to the existing winery and has a capacity of 91 gallons per minute (GPM). In the case of an emergency failure another well would be drilled immediately and hooked into the system. During this drilling time potable water could be trucked in from offsite if the existing emergency storage wasn't enough. Please see the well logs and other pertinent information in Attachment "E". The subject well is currently fitted with a 50' deep seal with a minimum 3" annular space. The well water has been tested for adverse and hazardous constituents as required by local, state and federal permitting agencies. Of the constituents tested for, none were over the legal limit for safe drinking water (the constituents that were tested for are shown in Attachment "D"). From the well the water will then be pumped through a network of PVC pipes rated for potable water to five 5000 gallon potable water storage tanks. From here the potable water is then routed to the winery building.

There is a total of one winery structure connected to this water system. Looking at the winery domestic and process wastewater calculations shown in Attachment "B", the maximum day demand (MDD) on this water system is 1507 gallons per day (GPD). The peak hourly demand (PHD) is (1507 x 1.5) = 2261 gallons per hour (GPH). Given that the subject well has a capacity of 91 GPM, at this rate it can provide a maximum of 131,040 GPD. Comparing this to the above MDD of 1507 GPD, there is more than enough daily capacity for the winery. Moving on to the PHD requirements. The code states that a water system must be able to provide the PHD for four consecutive hours which in this case is (2261 GPH x 4 H) = 9044 gallons. Given that the well can pump at 91 GPM this equals (91 GPM x 60 M x 4 H) = 21,840 gallons every four hours. Add this to the capacity of the 25,000 gallons in storage tanks, the maximum 4 hour capacity of this water system is 46,840 gallons. Comparing this to the required 9044 gallons, there is more than enough water available to meet the PHD requirements.

Looking at the entirety of both winery parcels water use and availability, the proposed calculated annual water use for the subject parcels is 17.14 acre feet. See the Water Availability Calculations in Attachment "B". Given that the combined parcels are 83.07 acres in size and is located in the MSE region, a groundwater recharge rate of 0.3 acre feet of water use per acre is appropriate. Given this the maximum allowed water

use for this parcel would be 24.92 acre feet of water per year. Comparing the proposed use of 17.47 acre feet per year to the above 24.92 acre feet value as well as the annual well capacity value of 146.79 acre feet per year, it is clear that the subject parcels and well have more than enough capacity to serve the proposed use.

Water Quality and Testing

The existing project well has been tested for water quality. The hazardous constituents tested are below allowable local, state and federal drinking water quality levels. Attachment "C" shows both the EPA and California allowable constituent levels. Attachment "D" shows the testing results. It is expected that this system will be placed in service for the proposed uses once the appropriate permits and improvements have been obtained and completed. Once the system is placed in service then continued testing will be as follows: quarterly testing for bacteria's, annual testing for nitrites, and nitrate testing once every three years.

Managerial Expectations

A qualified person will be hired to properly monitor, operate and maintain this water system. This persons responsibilities will be but are not limited to the following items:

1. Inspect the water system on a regular bases to make sure everything is operating properly and there are no possible points of contamination.
2. Personally fix any failures or components showing signs of wearing within the system or if necessary coordinate with service providers to fix such items.
3. Properly sample the water and send samples to the proper testing lab as required by the pertinent permitting agencies.
4. Notify winery owner and manager of any water system infrastructure needs and any planned water shutdown periods.
5. Develop emergency water system shutdown procedures and be able to implement them.

Financial Expectations

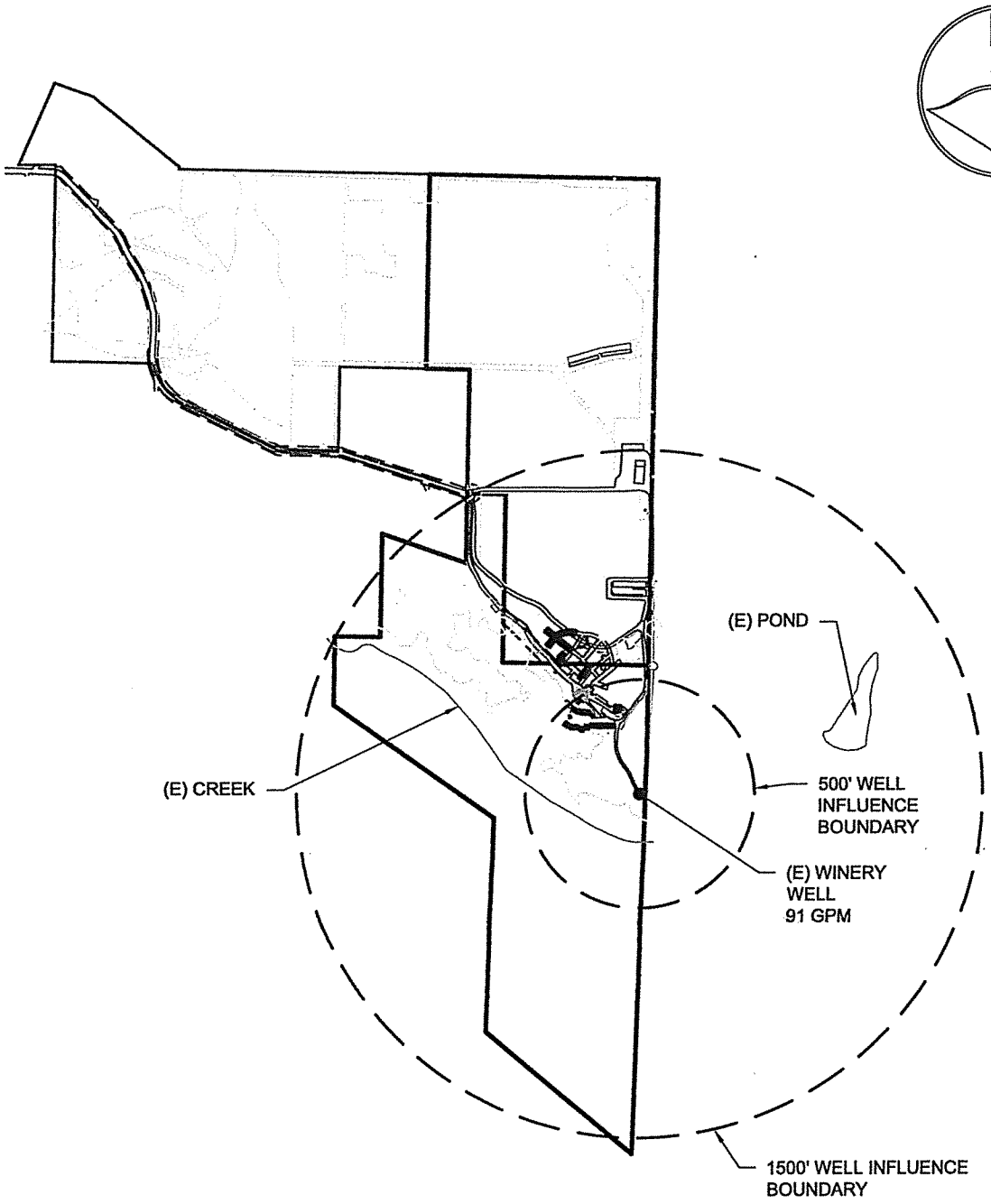
Currently it is estimated that the entire water system cost is $80,000 to install. It is expected that the system will have a usable lifespan of 30 years. It is expected to cost $1000 annually to operate, maintain and properly sample and test the water. It is expected that the system will cost roughly $134,000 to replace 30 years from now. To have this money available 30 years from now, $4467 must be set aside in a 0% annual interest rate account for the next 30 years. Thus it will cost an estimated $5467 per year to own, operate, maintain and eventually replace the subject water system. The Caldwell Vineyard Winery has more than adequate funds to meet the financial demands of this water system.

Conclusions

The Caldwell Vineyard Winery has an adequate water source for the proposed and existing uses on the subject parcel.

Attachment "A"

Well Location Map



WELL EXHIBIT

SHEET: 1 OF 1

PROJECT INFO:

CALDWELL VINEYARDS
WINERY
270 KREUZER LANE
NAPA, CA 94559
APN: 045-310-055 & 056

PREPARED BY:

CAMERON PRIDMORE PE, PLS
1607 CAPELL VALLEY ROAD
NAPA, CA 94558
(707) 815-0988

P #: 00193 DATE: 12/15/2016

CMP
CIVIL & LAND
ENGINEERING SURVEYING

Attachment "B"

Water Availability Analysis Calculations,
Wastewater Calculations

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Water Availability Analysis
for the
Caldwell Vineyard Winery

Located at:
270 Kreuzer Lane
Napa, CA 94558

Date: 1/20/2017

Project # 00193

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Hit ctrl+alt+shift+F9 when finished to recalc a

WATER AVAILABILITY ANALYSIS- PHASE ONE STUDY

WATER USE CALCULATIONS FOR EXISTING USE

RESIDENTIAL	#	FACTOR	AF/YR
PRIMARY RESIDENCES=	0	0.65	0.00
SECONDARY RESIDENCES=	0	0.25	0.00
FARM LBR DWELLING (# OF PPL) =	0	0.08	0.00
		SUB TOTAL=	0.00

NON- RESIDENTIAL CALCULATIONS

AGRICULTURAL	# ACRE	FACTOR	AF/YR
VINEYARD IRRIGATION ONLY=	30.32	0.3	9.10
VINEYARD HEAT PROTECTION=	30.32	0.25	7.58
VINEYARD FROST PROTECTION=	0	0.25	0.00
IRRIGATED PASTURE=	0	4	0.00
ORCHARDS=	0	4	0.00
LIVESTOCK (SHEEP/COWS)=	0	0.01	0.00
		SUB TOTAL=	16.68
WINERY	**# GAL**	**FACTOR**	**AF/YR**
PROCESS WATER=	25000	SEE WW CALCS	0.38
DOMESTIC AND LANDSCAPING=	25000	SEE WW CALCS	0.08
		SUB TOTAL=	0.46
INDUSTRIAL	**# EMPL**	**FACTOR**	**AF/YR**
FOOD PROCESSING=	0	31	0.00
PRINTING/ PUBLISHING=	0	0.6	0.00
		SUB TOTAL=	0.00
COMMERCIAL	**# EMPL**	**FACTOR**	**AF/YR**
OFFICE SPACE=	0	0.01	0.00
WAREHOUSE=	0	0.05	0.00
		SUB TOTAL=	0.00

EXISTING USE TOTALS

RESIDENTIAL=	0.00	AF/YR
AGRICULTURAL=	16.68	AF/YR
WINERY=	0.46	AF/YR
INDUSTRIAL=	0.00	AF/YR
COMMERCIAL=	0.00	AF/YR
OTHER USAGE (LIST BELOW)		
		AF/YR
		AF/YR
		AF/YR
		AF/YR
		AF/YR
TOTAL EXISTING WATER USE=	**5583402**	**G/YR**
TOTAL EXISTING WATER USE=	**17.14**	**AF/YR**

WATER AVAILABILTY CALCULATIONS FOR EXISTING USE			
WELL NUMBER	Q - GPM	AF/YR	
1	91	146.794	
2		0.000	
3		0.000	
4		0.000	
5		0.000	
TOTAL=	91	146.794	
SPRING NUMBER	Q - GPM	AF/YR	
1		0.000	
2		0.000	
3		0.000	
4		0.000	
5		0.000	
TOTAL=	0	0.000	
TANK #	GAL	AF	
1	5000	0.015	
2	5000	0.015	
3	5000	0.015	
4	5000	0.015	
5	5000	0.015	
TOTAL=	25000	0.077	
RESERVOIR #	GAL	AF	
1	0.000		
2	0.000		
3	0.000		
4	0.000		
5	0.000		
TOTAL=	0.000	0	
GROUND WATER RECHARGE	AF/YR/ACRE	PARCEL AC	AF/YR
assumed worst case recharge rate =	0.30	83.07	24.92
TOTAL AVAILABLE WATER =	**8119979.52**	**G/YR**	
TOTAL AVAILABLE WATER =	**24.92**	**AF/YR**	
TOTAL EXISTING WATER USE=	**17.14**	**AF/YR**	
REMAINING AVAILABLE WATER =	**7.78**	**AF/YR**	

WATER USE CALCULATIONS FOR PROPOSED USE				
RESIDENTIAL	**#**	**FACTOR**	**AF/YR**	
PRIMARY RESIDENCES=	0	0.65	0.00	
SECONDARY RESIDENCES=	0	0.25	0.00	
FARM LBR DWELLING (# OF PPL) =	0	0.08	0.00	
		SUB TOTAL=	0.00	
NON- RESIDENTIAL CALCULATIONS				
AGRICULTURAL	**# ACRE**	**FACTOR**	**AF/YR**	
VINEYARD IRRIGATION ONLY=	30.32	0.3	9.10	
VINEYARD HEAT PROTECTION=	30.32	0.25	7.58	
VINEYARD FROST PROTECTION=	0	0.25	0.00	
IRRIGATED PASTURE=	0	4	0.00	
ORCHARDS=	0	4	0.00	
LIVESTOCK (SHEEP/COWS)=	0	0.01	0.00	
		SUB TOTAL=	16.68	
WINERY	**# GAL**	**FACTOR**	**AF/YR**	
PROCESS WATER =	35000	SEE WW CALC	0.54	
DOMESTIC WATER =	35000	SEE WW CALC	0.25	
		SUB TOTAL=	0.79	
INDUSTRIAL	**# EMPL**	**FACTOR**	**AF/YR**	
FOOD PROCESSING=	0	31	0.00	
PRINTING/ PUBLISHING=	0	0.6	0.00	
		SUB TOTAL=	0.00	
COMMERCIAL	**# EMPL**	**FACTOR**	**AF/YR**	
OFFICE SPACE=	0	0.01	0.00	
WAREHOUSE=	0	0.05	0.00	
		SUB TOTAL=	0.00	

PROPOSED USE TOTALS		
RESIDENTIAL=	0.00	AF/YR
AGRICULTURAL=	16.68	AF/YR
WINERY=	0.79	AF/YR
INDUSTRIAL=	0.00	AF/YR
COMMERCIAL=	0.00	AF/YR
OTHER USAGE (LIST BELOW)		
		AF/YR
		AF/YR
		AF/YR
		AF/YR
		AF/YR
TOTAL PROPOSED WATER USE=	**5690926**	**G/YR**
TOTAL PROPOSED WATER USE=	**17.47**	**AF/YR**

WATER AVAILABILTY CALCULATIONS FOR PROPOSED USE			
WELL NUMBER	Q - GPM	AF/YR	
1	91	146.794	
2		0.000	
3		0.000	
4		0.000	
5		0.000	
TOTAL=	91	146.794	
SPRING NUMBER	Q - GPM	AF/YR	
1		0.000	
2		0.000	
3		0.000	
4		0.000	
5		0.000	
TOTAL=	0	0.000	
TANK #	GAL	AF	
1	5000	0.015	
2	5000	0.015	
3	5000	0.015	
4	5000	0.015	
5	5000	0.015	
TOTAL=	25000	0.077	
RESERVOIR #	GAL	AF	
1	0		
2	0		
3	0		
4	0		
5	0		
TOTAL=	0	0.000	
GROUND WATER RECHARGE	AF/YR/ACRE	PARCEL AC	AF/YR
assumed worst case recharge rate =	0.30	83.07	24.92
TOTAL WATER AVAILABLE =	**8119979.52**	**G/YR**	
TOTAL WATER AVAILABLE =	**24.92**	**AF/YR**	
TOTAL PROPOSED WATER USE=	**17.47**	**AF/YR**	
REMAINING AVAILABLE WATER =	**7.45**	**AF/YR**	

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Existing Winery Wastewater Flow Calculations

for the

Caldwell Vineyard Winery

Located at:

270 Kreuzer Lane

Napa, CA 94558

Date: 1/20/2017

Project # 00193

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Winery Waste Flow Summary

Below are the calculations for the existing subject winery wastewater flows.

Winery Proposed Process Waste Flow Calculations

Wine Production =	25000	gal/wine/yr
Crush Duration =	45.00	days (30 -60)
Peak Process Waste Flows During Crush =	833.33	gal/day ((1.5 x production)/crush days)
Average Process Flows (non crush) =	342.47	gal/day ((5 x production)/days in yr)
Additional Process Flow =	0.00	gal/day (usually 0)
Total Design Peak Process Waste Flows =	**833.33**	gal/day

Existing & Proposed Domestic Waste Flows

Typical Crush Weekend		
Number of FT Employees =	2	#
Number of PT Employees =	1	#
Number of daily visitors =	8	#
Event people count serviced by this system =	10	# (no visitors on event days)
FT employee daily domestic waste flow =	30.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	8.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	24.00	gal/day (3 g/p)
Event daily domestic waste flow =	50.00	gal/day (5 g/p)
Winery Dimestic Flow =	**62.00**	**gal/day**
Typical Non Crush Weekend		
Number of FT Employees =	2	#
Number of PT Employees =	1	#
Number of daily visitors =	8	#
Event people count serviced by this system =	60	# (no visitors on event days)
FT employee daily domestic waste flow =	30.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	8.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	24.00	gal/day (3 g/p)
Event daily domestic waste flow =	300.00	gal/day (5 g/p)
Winery Dimestic Flow =	**300.00**	**gal/day**
Typical Weekday		
Number of FT Employees =	2	#
Number of PT Employees =	1	#
Number of daily visitors =	8	#
Event people count serviced by this system =	60	# (no visitors on event days)
FT employee daily domestic waste flow =	30.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	8.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	24.00	gal/day (3 g/p)
Event daily domestic waste flow =	300.00	gal/day (5 g/p)
Winery Dimestic Flow =	**300.00**	gal/day

Total Winery Waste Peak Design Flows =	**1133**	**gal/day**

Combined Winery Waste Annual Volume Calculations

Winery Combined Process & Domestic Waste Flows

Typical Crush Weekend Volumes		
Number of FT Employees =	2	#
Number of PT Employees =	1	#
Number of daily visitors =	8	#
FT employee daily domestic waste flow =	30.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	8.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	24.00	gal/day (3 g/p)
Number of Flow Days =	45.00	gal/day
Total domestic wastewater volume =	2790	gal/year
Total process wastewater volume =	15411	gal/year
Combined Process and Domestic Volume =	18201	gal/year

Typical Non Crush Weekend Volumes		
Number of FT Employees =	2	#
Number of PT Employees =	1	#
Number of daily visitors =	8	#
FT employee daily domestic waste flow =	30.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	8.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	24.00	gal/day (3 g/p)
Number of Flow Days =	90.00	gal/day
Total domestic wastewater volume =	5580	gal/year
Total process wastewater volume =	30822	gal/year
Combined Process and Domestic Volume =	36402	gal/year

Typical Weekday Volumes		
Number of FT Employees =	2	#
Number of PT Employees =	1	#
Number of daily visitors =	8	#
FT employee daily domestic waste flow =	30.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	8.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	24.00	gal/day (3 g/p)
Number of Flow Days =	230.00	gal/day
Total domestic wastewater volume =	14260	gal/year
Total process wastewater volume =	78767	gal/year
Combined Process and Domestic Volume =	93027	gal/year

Special Event Visitor Volumes	visitors	days/yr	flow/day	gallons
Large Events =	60	2	5	600
Medium Events =	50	2	5	500
Small =	10	10	5	500
Very Small =	0	0	5	0
Total Annual Event Visitor Waste Volume =	1600	gal/year		

Total annual domestic wastewater volume =	**24230**	**gal/yr**	**0.07**	**af**
Total annual process wastewater volume =	**125000**	**gal/yr**	**0.38**	**af**
Total Winery Wastewater Annual Vol =	**149230**	**gal/yr**	**0.46**	**af**

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Proposed Winery Wastewater Flow Calculations

for the

Caldwell Vineyard Winery

Located at:

270 Kreuzer Lane

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Date: 1/20/2017

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Hit ctrl + alt + shift + F9 when finished to recalc all formulas

Winery Waste Flow Summary

The existing winery wastewater system was designed to handle 353 gallons per day of domestic flow and 1700 gallons of process flow for a total peack flow of 2053 gallons. The proposed change in use will not increase this peak flow. Previous process waste flow capacity is going to be converted to domestic waste flow capacity. No improvements will be neccessary to the existing wastewater system. The medium and large events will be serviced by portable toilets.

Winery Proposed Process Waste Flow Calculations

Wine Production =	35000	gal/wine/yr
Crush Duration =	45.00	days (30 -60)
Peak Process Waste Flows During Crush =	1166.67	gal/day ((1.5 x production)/crush days)
Average Process Flows (non crush) =	479.45	gal/day ((5 x production)/days in yr)
Additional Process Flow =	0.00	gal/day (usually 0)
Total Design Peak Process Waste Flows =	**1166.67**	gal/day

Existing & Proposed Domestic Waste Flows

Typical Crush Weekend		
Number of FT Employees =	6	#
Number of PT Employees =	6	#
Number of daily visitors =	60	#
Event people count serviced by this system =	68	# (no visitors on event days)
FT employee daily domestic waste flow =	90.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	48.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	180.00	gal/day (3 g/p)
Event daily domestic waste flow =	340.00	gal/day (5 g/p)
Winery Dimestic Flow =	**340.00**	**gal/day**
Typical Non Crush Weekend		
Number of FT Employees =	6	#
Number of PT Employees =	0	#
Number of daily visitors =	45	#
Event people count serviced by this system =	68	# (no visitors on event days)
FT employee daily domestic waste flow =	90.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	0.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	135.00	gal/day (3 g/p)
Event daily domestic waste flow =	340.00	gal/day (5 g/p)
Winery Dimestic Flow =	**340.00**	**gal/day**
Typical Weekday		
Number of FT Employees =	6	#
Number of PT Employees =	0	#
Number of daily visitors =	30	#
Event people count serviced by this system =	68	# (no visitors on event days)
FT employee daily domestic waste flow =	90.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	0.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	90.00	gal/day (3 g/p)
Event daily domestic waste flow =	340.00	gal/day (5 g/p)
Winery Dimestic Flow =	**340.00**	gal/day

Total Winery Waste Peak Design Flows =	**1507**	**gal/day**

Combined Winery Waste Annual Volume Calculations

Winery Combined Process & Domestic Waste Flows

Typical Crush Weekend Volumes		
Number of FT Employees =	6	#
Number of PT Employees =	6	#
Number of daily visitors =	60	#
FT employee daily domestic waste flow =	90.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	48.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	180.00	gal/day (3 g/p)
Number of Flow Days =	45.00	gal/day
Total domestic wastewater volume =	14310	gal/year
Total process wastewater volume =	21575	gal/year
Combined Process and Domestic Volume =	35885	gal/year

Typical Non Crush Weekend Volumes		
Number of FT Employees =	6	#
Number of PT Employees =	0	#
Number of daily visitors =	45	#
FT employee daily domestic waste flow =	90.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	0.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	135.00	gal/day (3 g/p)
Number of Flow Days =	90.00	gal/day
Total domestic wastewater volume =	20250	gal/year
Total process wastewater volume =	43151	gal/year
Combined Process and Domestic Volume =	63401	gal/year

Typical Weekday Volumes		
Number of FT Employees =	6	#
Number of PT Employees =	0	#
Number of daily visitors =	30	#
FT employee daily domestic waste flow =	90.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	0.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	90.00	gal/day (3 g/p)
Number of Flow Days =	230.00	gal/day
Total domestic wastewater volume =	41400	gal/year
Total process wastewater volume =	110274	gal/year
Combined Process and Domestic Volume =	151674	gal/year

Special Event Visitor Volumes	visitors	days/yr	flow/day	gallons
Large Events =	200	1	5	1000
Medium Events =	128	3	5	1920
Small =	68	3	5	1020
Very Small =	28	12	5	1680
Total Annual Event Visitor Waste Volume =	5620	gal/year		

Total annual domestic wastewater volume =	**81580**	**gal/yr**	**0.25**	**af**
Total annual process wastewater volume =	**175000**	**gal/yr**	**0.54**	**af**
Total Winery Wastewater Annual Vol =	**256580**	**gal/yr**	**0.79**	**af**

Attachment "C"

EPA and California Allowable Drinking
Water Constituent Levels

MAXIMUM CONTAMINANT LEVELS AND REGULATORY DATES FOR DRINKING WATER U.S. EPA VS CALIFORNIA

NOVEMBER 2008

Contaminant	U.S. EPA		California	
	MCL (mg/L)	Date[a]	MCL (mg/L)	Effective Date
Inorganics				
Aluminum	0.05 to 0.2[b]	1/91	1 0.2[b]	2/25/89 9/8/94
Antimony	0.006	7/92	0.006	9/8/94
Arsenic	0.05 0.010	eff: 6/24/77 eff: 1/23/06	0.05 0.010	77 11/28/08
Asbestos	7 MFL[c]	1/91	7 MFL[c]	9/8/94
Barium	1 2	eff: 6/24/77 1/91	1	77
Beryllium	0.004	7/92	0.004	9/8/94
Cadmium	0.010 0.005	eff: 6/24/77 1/91	0.010 0.005	77 9/8/94
Chromium	0.05 0.1	eff: 6/24/77 1/91	0.05	77
Copper	1.3[d]	6/91	1[b] 1.3[d]	77 12/11/95
Cyanide	0.2	7/92	0.2 0.15	9/8/94 6/12/03
Fluoride	4 2[b]	4/86 4/86	2	4/98
Lead	0.05[e] 0.015[d]	eff: 6/24/77 6/91	0.05[e] 0.015[d]	77 12/11/95
Mercury	0.002	eff: 6/24/77	0.002	77
Nickel	Remanded		0.1	9/8/94
Nitrate	(as N) 10	eff: 6/24/77	(as N03) 45	77
Nitrite (as N)	1	1/91	1	9/8/94
Total Nitrate/Nitrite (as N)	10	1/91	10	9/8/94
Perchlorate	-	-	0.006	10/18/07
Selenium	0.01 0.05	eff: 6/24/77 1/91	0.01 0.05	77 9/8/94
Thallium	0.002	7/92	0.002	9/8/94
Radionuclides				
Uranium	30 ug/L	12/7/00	20 pCi/L 20 pCi/L	1/1/89 6/11/06
Combined Radium - 226+228	5 pCi/L	eff: 6/24/77	5 pCi/L 5 pCi/L	77 6/11/06
Gross Alpha particle activity (excluding radon & uranium)	15 pCi/L	eff: 6/24/77	15 pCi/L 15 pCi/L	77 6/11/06
Gross Beta particle activity	4 millirem/yr	eff: 6/24/77	50 pCi/L[f] 4 millirem/yr	77 6/11/06
Strontium-90	8 pCi/L	eff: 6/24/77 now covered by Gross Beta	8 pCi/L[f] 8 pCi/L[f]	77 6/11/06
Tritium	20,000 pCi/L	eff: 6/24/77 now covered by Gross Beta	20,000 pCi/L[f] 20,000 pCi/L[f]	77 6/11/06

Contaminant	U.S. EPA		California	
	MCL (mg/L)	Date[a]	MCL (mg/L)	Effective Date
VOCS				
Benzene	0.005	6/87	0.001	2/25/89
Carbon Tetrachloride	0.005	6/87	0.0005	4/4/89
1,2-Dichlorobenzene	0.6	1/91	0.6	9/8/94
1,4-Dichlorobenzene	0.075	6/87	0.005	4/4/89
1,1-Dichloroethane	-	-	0.005	6/24/90
1,2-Dichloroethane	0.005	6/87	0.0005	4/4/89
1,1-Dichloroethylene	0.007	6/87	0.006	2/25/89
cis-1,2-Dichloroethylene	0.07	1/91	0.006	9/8/94
trans-1,2-Dichloroethylene	0.1	1/91	0.01	9/8/94
Dichloromethane	0.005	7/92	0.005	9/8/94
1,3-Dichloropropene	-	-	0.0005	2/25/89
1,2-Dichloropropane	0.005	1/91	0.005	6/24/90
Ethylbenzene	0.7	1/91	0.68 0.7 0.3	2/25/89 9/8/94 6/12/03
Methyl-tert-butyl ether (MTBE)	-	-	0.005[b] 0.013	1/7/99 5/17/00
Monochlorobenzene	0.1	1/91	0.03 0.07	2/25/89 9/8/94
Styrene	0.1	1/91	0.1	9/8/94
1,1,2,2-Tetrachloroethane	-	-	0.001	2/25/89
Tetrachloroethylene	0.005	1/91	0.005	5/89
Toluene	1	1/91	0.15	9/8/94
1,2,4 Trichlorobenzene	0.07	7/92	0.07 0.005	9/8/94 6/12/03
1,1,1-Trichloroethane	0.200	6/87	0.200	2/25/89
1,1,2-Trichloroethane	0.005	7/92	0.032 0.005	4/4/89 9/8/94
Trichloroethylene	0.005	6/87	0.005	2/25/89
Trichlorofluoromethane	-	-	0.15	6/24/90
1,1,2-Trichloro-1,2,2-Trifluoroethane	-	-	1.2	6/24/90
Vinyl chloride	0.002	6/87	0.0005	4/4/89
Xylenes	10	1/91	1.750	2/25/89

Contaminant	U.S. EPA		California	
	MCL (mg/L)	Date[a]	MCL (mg/L)	Effective Date
SOCS				
Alachlor	0.002	1/91	0.002	9/8/94
Atrazine	0.003	1/91	0.003 0.001	4/5/89 6/12/03
Bentazon	-	-	0.018	4/4/89
Benzo(a) Pyrene	0.0002	7/92	0.0002	9/8/94
Carbofuran	0.04	1/91	0.018	6/24/90
Chlordane	0.002	1/91	0.0001	6/24/90
Dalapon	0.2	7/92	0.2	9/8/94
Dibromochloropropane	0.0002	1/91	0.0001 0.0002	7/26/89 5/3/91
Di(2-ethylhexyl)adipate	0.4	7/92	0.4	9/8/94
Di(2-ethylhexyl)phthalate	0.006	7/92	0.004	6/24/90
2,4-D	0.1 0.07	eff: 6/24/77 1/91	0.1 0.07	77 9/8/94
Dinoseb	0.007	7/92	0.007	9/8/94
Diquat	0.02	7/92	0.02	9/8/94
Endothall	0.1	7/92	0.1	9/8/94
Endrin	0.0002 0.002	eff: 6/24/77 7/92	0.0002 0.002	77 9/8/94
Ethylene Dibromide	0.00005	1/91	0.00002 0.00005	2/25/89 9/8/94
Glyphosate	0.7	7/92	0.7	6/24/90
Heptachlor	0.0004	1/91	0.00001	6/24/90
Heptachlor Epoxide	0.0002	1/91	0.00001	6/24/90
Hexachlorobenzene	0.001	7/92	0.001	9/8/94
Hexachlorocyclopentadiene	0.05	7/92	0.05	9/8/94
Lindane	0.004 0.0002	eff: 6/24/77 1/91	0.004 0.0002	77 9/8/94
Methoxychlor	0.1 0.04	eff: 6/24/77 1/91	0.1 0.04 0.03	77 9/8/94 6/12/03
Molinate	-	-	0.02	4/4/89
Oxamyl	0.2	7/92	0.2 0.05	9/8/94 6/12/03
Pentachlorophenol	0.001	1/91	0.001	9/8/94
Picloram	0.5	7/92	0.5	9/8/94
Polychlorinated Biphenyls	0.0005	1/91	0.0005	9/8/94
Simazine	0.004	7/92	0.010 0.004	4/4/89 9/8/94
Thiobencarb	-	-	0.07 0.001[b]	4/4/89 4/4/89
Toxaphene	0.005 0.003	eff: 6/24/77 1/91	0.005 0.003	77 9/8/94
2,3,7,8-TCDD (Dioxin)	$3x10^{-8}$	7/92	$3x10^{-8}$	9/8/94
2,4,5-TP (Silvex)	0.01 0.05	eff: 6/24/77 1/91	0.01 0.05	77 9/8/94

Contaminant	U.S. EPA		California	
	MCL (mg/L)	Date[a]	MCL (mg/L)	Effective Date
Disinfection Byproducts				
Total Trihalomethanes	0.100 0.080	11/29/79 eff: 11/29/83 eff: 1/1/02 [g]	0.100 0.080	3/14/83 6/17/06
Haloacetic acids (five)	0.060	eff: 1/1/02 [g]	0.060	6/17/06
Bromate	0.010	eff: 1/1/02 [g]	0.010	6/17/06
Chlorite	1.0	eff: 1/1/02 [g]	1.0	6/17/06
Treatment Technique				
Acrylamide	TT[h]	1/91	TT[h]	9/8/94
Epichlorohydrin	TT[h]	1/91	TT[h]	9/8/94

a. "eff." indicates the date the MCL took effect; any other date provided indicates when USEPA established (i.e., published) the MCL.
b. Secondary MCL.
c. MFL = million fibers per liter, with fiber length > 10 microns.
d. Regulatory Action Level; if system exceeds, it must take certain actions such as additional monitoring, corrosion control studies and treatment, and for lead, a public education program; replaces MCL.
e. The MCL for lead was rescinded with the adoption of the regulatory action level described in footnote d.
f. Gross beta MCL is 4 millirem/year annual dose equivalent to the total body or any internal organ; Sr-90 MCL = 4 millirem/year to bone marrow; tritium MCL = 4 millirem/year to total body
g. Effective for surface water systems serving more than 10,000 people; effective for all others 1/1/04.
h. TT = treatment technique, because an MCL is not feasible.

Attachment "D"

Water Quality Testing Results

Tuesday, November 08, 2016

Kelvin Morasch
Caldwell Vineyard
1558 Silverado Trail
Napa, CA 94559

Re Lab Order: R101069 Collected By: KELVIN M.
Project ID: CALDWELL WINERY WELL PO/Contract #: CC/S573.00

Dear Kelvin Morasch:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, October 20, 2016. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Enclosures

Project Manager: Eli N. Greenwald

1885 North Kelly Road • Napa, California 94558
(707) 258-4000 • Fax (707) 226-1001 • e-mail: info@caltestlabs.com

SAMPLE SUMMARY

Lab Order: R101069
Project ID: CALDWELL WINERY WELL

Lab ID	Sample ID	Matrix	Date Collected	Date Received
R101069001	WELL	Water	10/20/2016 16:15	10/20/2016 16:50

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NARRATIVE

Lab Order: R101069
Project ID: CALDWELL WINERY WELL

General Qualifiers and Notes

Caltest authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that all test results for wastewater and hazardous waste analyses meet all applicable NELAC requirements; all microbiology and drinking water testing meet applicable ELAP requirements, unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 20th Edition except where noted (SMOL=online edition).

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (RL), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Filtrations performed at Caltest for dissolved metals (excluding mercury) and/or pH analysis are not performed within the 15 minute holding time as specified by 40CFR 136.3 table II.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte. An analyte not detected at or above the RL is reported as ND unless otherwise noted or qualified. For analyses pertaining to the State Implementation Plan of the California Toxics Rule, the Caltest Reporting Limit (RL) is equivalent to the Minimum Level (ML). A standard is always run at or below the ML. Where Reporting Limits are elevated due to dilution, the ML calibration criteria has been met.

J - reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

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ANALYTICAL RESULTS

Lab Order: R101069
Project ID: CALDWELL WINERY WELL

Lab ID	**R101069001**	Date Collected	10/20/2016 16:15	Matrix	Water
Sample ID	**WELL**	Date Received	10/20/2016 16:50		

Parameters	Result	Units	R. L.	DF	Prepared	Batch	Analyzed	Batch	Qual
pH, Electrometric Analysis	**Analytical Method:**		SM 4500-H+ B-00				**Analyzed by:**	DR	
pH	7.7	pH Units		1			10/21/16 11:25	BIO 17079	
Calculation, Hardness	**Analytical Method:**		Calculated				**Analyzed by:**	LM	
Hardness Calculation	60	mg/L	0.5	1			11/05/16 23:21	CALC	
Mercury Analysis by FIMS	**Prep Method:**		EPA 245.1		**Prep by:**	UKS			
	Analytical Method:		EPA 245.1				**Analyzed by:**	LM	
Mercury	ND	mg/L	0.0002	1	10/27/16 00:00	MPR 14726	10/28/16 10:27	MHG 5425	
Metals by ICPMS, Collision Mode, Total	**Prep Method:**		EPA 200.8		**Prep by:**	UKS			
	Analytical Method:		EPA 200.8				**Analyzed by:**	LM	
Aluminum	ND	mg/L	0.20	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Antimony	ND	mg/L	0.010	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Arsenic	0.0030	mg/L	0.0020	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Barium	0.031	mg/L	0.0050	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Beryllium	ND	mg/L	0.0010	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Cadmium	ND	mg/L	0.0010	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Calcium	10	mg/L	0.50	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Chromium	ND	mg/L	0.0050	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Iron	1.2	mg/L	0.10	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Magnesium	8.6	mg/L	0.50	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Manganese	0.19	mg/L	0.0050	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Nickel	ND	mg/L	0.0050	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Selenium	ND	mg/L	0.010	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Sodium	22	mg/L	1.0	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Thallium	ND	mg/L	0.010	4	10/26/16 00:00	MPR 14724	11/05/16 23:21	MMS 8252	
Nitrogen, Nitrite Analysis	**Analytical Method:**		SM 4500-NO2 B-00				**Analyzed by:**	CLM	
Nitrogen, Nitrite (as N)	ND	mg/L	0.03	1			10/21/16 10:12	WCO 12122	
Anions by Ion Chromatography	**Analytical Method:**		EPA 300.0				**Analyzed by:**	MYS	
Nitrogen, Nitrate (as N)	ND	mg/L	0.1	1			10/21/16 04:36	WIC 5584	
Fluoride	0.23	mg/L	0.1	1			10/21/16 04:36	WIC 5584	
Alkalinity, Total Analysis	**Analytical Method:**		SM 2320 B-97				**Analyzed by:**	CLM	
Bicarbonate (as CACO3)	95	mg/L	10	1			10/26/16 20:45	WTI 2840	
Carbonate (as CACO3)	ND	mg/L	10	1			10/26/16 20:45	WTI 2840	
Hydroxide (as CACO3)	ND	mg/L	10	1			10/26/16 20:45	WTI 2840	
Alkalinity, Total (as CACO3)	95	mg/L	10	1			10/26/16 20:45	WTI 2840	

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(707) 258-4000 • Fax (707) 226-1001 • e-mail: info@caltestlabs.com

Dear Client:

Caltest provides a variety of water analyses, but cannot provide an opinion regarding the quality of the water or its suitability for any particular use. If you would like information, please feel free to contact any of the following suggested resources listed below.

Human Health Concerns:

EPA Safe Drinking Water Hotline	800/426-4791
Napa County Environmental Health	707/253-4471
Sonoma County Environmental Health	707/565-6565

Irrigation Concerns:

University of California at Davis Department of Land, Air, and Water Resources/ Cooperative Extension. Ask for Blaine Hanson or Steve Grattan	530/752-1130

Thank you for choosing Caltest for your water testing needs. Please feel free to contact us if we can provide you with any further testing assistance.

Sincerely,
Caltest Analytical Laboratory

Todd M Albertson
Vice President

(For your information, the next page contains various regulatory limits)

Caltest
ANALYTICAL LABORATORY

1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlabs.com

SAMPLE CHAIN OF CUSTODY

PAGE _____ OF _____

LAB ORDER #: 1010169

32 of 36

PROJECT # / PROJECT NAME: Caldwell Winery Well

P.O. #:

CLIENT: Caldwell Winery Napa

REPORT ATTN:

ADDRESS: 270 Kreyzer Lane CITY: STATE: Ca ZIP: 94559

BILLING ADDRESS: 1558 Silverado Trail

PHONE #: 707-738-6278 FAX PHONE:

SAMPLER (PRINT & SIGN NAME): Kelvin Morasch

ANALYSES REQUESTED

See Attached

TURN-AROUND TIME
- [x] STANDARD
- [ ] RUSH

DUE DATE:

REV. 2/13

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	REMARKS
	10.20	4:45				Well			

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	RELINQUISHED BY	DATE/TIME	RECEIVED BY
Kelvin Morasch	10/20/16 1650				

FOR LAB USE ONLY

Samples: WC_____ MICRO_____ BIO_____ MET_____ SV_____ VOA_____ TEMP:_____ °C SEALED: Y___ / N___ INTACT: Y___ / N___

BD: BIO_____ WC_____ MET_____

CC: AA_____ SV_____ VOA_____

SIL: HP_____ PT_____ QT_____ VOA_____

W/HNO,_____ H,SO,_____ NaOH_____

PIL: HNO,_____ H,SO,_____ NaOH_____ HCL_____

COMMENTS

Email

Ka Morasch @ yahoo . Com

MATRIX: W = Aqueous Nondrinking Water, Digested Metals; ML = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product

CONTAINER TYPES: AL = Amber Liter; AHL = 500 ml Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL VOA; OTC = Other Type Container

WHITE - ORIGINAL TO LABORATORY YELLOW - CLIENT COPY AS RECEIPT

Well Drilling & Pump Service
878 El Centro Ave. Napa Ca, 94558
Office 707-255-6450
Fax 707-255-6489
Licenses #396352

WELL INSPECTION REPORT FOR

Attn: Caldwell Vineyard **Date of test:** November 2nd, 2016
Upon your request, we have checked the well and/or pressure system at
270 Kreuzer Ln., Napa
Our findings are as follows:

WELL INFORMATION

Casing Size: 8" PVC f480 well casing
Static Water Level: Artesian (a **well** in which water is under pressure; especially : one in which the water flows to the surface naturally
Well Depth: 500' * **draw down during test:** 40" from top of casing
Total water draw down in feet from static water level at end of flow test 40"
How tested: Open discharge with existing pumping equipment
Well yield after test: 91 Gallons per minute after 8 hours of continuous pumping
Well Comments: Well is a year-round artesian.

WELL EQUIPMENT INFORMATION

Pump Make: Grundfos **HP** 10 **Pump Setting:** 315' **
Type: Submersible **Voltage:** 460 **Pipe Size:** 3" Galvanized
Pump Model: 85S100-9 * **Phase:** 3 **Wire Size:** #10-3/wg submersible flat jacket
Storage tank: pump deliver water to an upper 5000 gallons' poly tank on demand
Comments: Pump was installed 09/28/2009. *Model, install date and setting found in pump panels.

PUMP PREFORMENS AND DESING

1- Well pump is design to deliver approx. 110 GPM at no pressure
2- Well pump is design to deliver approx. 75-80 GPM to storage tank under normal pumping conditions.

McLEAN & WILLIAMS
SINCE 1949

WELL TEST INFORMATION

*Hours	Time	water level	Draw down	GPM	Comments
0	9:40am	Artesian	0	170	10 PSI Backpressure
1	10:40	8"	8"	124	14 PSI Backpressure
2	11:40	17"	17"	103	49 PSI Backpressure
3	12:40p.m.	28"	28"	91	68 PSI Backpressure
4	1:40	33"	33"	91	68 PSI Backpressure
5	2:30	36"	36"	91	
6	3:30	38"	38"	91	
7	4:30	39"	39"	91	
8	5:30	40"	40"	91	
		Inches			
RECOVERY	Time	W/Level	In./ Recovery	Flow/Rate	
.00hr	5:30	40"	0	0	Original Static
.25hr	5:45	Artesian	40"	0	
.50hr	6:00			0	
.75hr	6:15			0	
1.00hr	6:30			0	
1.25hr	6:45			0	
1.50hr	7:00			0	
1.75hr	7:15			0	
2.00hr	7:30			0	
3.00hr	8:30			0	
4.00hr	9:30			0	
5.00hr	10:30		"	0	

NOTE: Need to meet 95% recovery by hour 8

Summary:

1. Static Water level at beginning of test: Artesian from top of casing
2. Static Water recovery at end of recovery: 0" from top of casing
3. Recovery to; _Artesian, within: 3 minutes (Artesian a **well** in which water is under pressure; especially: one in which the water flows to the surface naturally
   (Recovery time)

Draw-down in feet: 3.3'

4. Well capacity (gpm) __91__ gpm
5. Specific Capacity Well Yield GPM/ft of drawdown: _27.58_ gpm/ft

WATER SAMPLES

No water samples requested at time of flow test.

FINAL COMMENTS

1- Well is a strong producer and had a 100% full recovery within a minute after completion of test was done.
2- Please note that flow test results by McLean and Williams Inc. represents the well water yield and system condition for the time of the test only.

Gonzalo Salinas
Mclean & Williams Inc.
gonzalo@mcleanandwillimas.com

Thank you, *Gonzalo Salinas*