RAM ENGINEERING
WASTEWATER & CIVIL ENGINEERING
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July 25, 2013

County of Napa Conservation,
Development, and Planning Department
1195 Third Street, Suite 210
Napa, CA 94559

Attention: Project Planner

Re: Long Meadow Ranch
Rutherford Winery
1790 St. Helena Highway
Rutherford, CA
APN 030-100-016
(formerly APN 030-100-003 & 4)
Use Permit Application
Wastewater Feasibility Study
RAM Project No. 2013002

To Whom It May Concern:

The purpose of this letter is to supplement the Long Meadow Ranch Rutherford Winery Use Permit Application, which is requesting an annual production up to 100,000 gallons of wine (30,000 gallons of red and 70,000 gallons of white wine). Tasting room visitors on the order of 50 persons maximum per day are also anticipated and requested. RAM Engineering has prepared this Wastewater Feasibility Study for the purpose of assessing the onsite sanitary and process wastewater system treatment and disposal capacity necessary for the proposed use.

The sanitary wastewater (SW) consists of wastewater from the laboratory and restroom facilities. The process wastewater (PW) consists of winery wastewater generated from producing 100,000 gallons of wine on site. The proposed new SW wastewater management system will consist of a SW septic tank, a SW sump tank with approved pre-treatment and a subsurface drip dispersal system with a designated 200% expansion/reserve area. The PW wastewater disposal system will consist of one of two options. Option A would include a rotary screen for solids filtration, septic/settling tanks, an aerated textile pre-treatment unit, an above ground aerated storage tank, with above ground drip irrigation of the existing vineyard on site. Option B would include a rotary screen for solids filtration, septic/settling tanks, an aerated textile pre-treatment unit, and disposal in a subsurface drip dispersal system. This facility is also planning on implementing a Winery Process Wash Water Recycling program as outlined in a Technical Report dated June 2, 2009 out of UC Davis. This recycling program would reduce the amount of wastewater generated, as the PW would be reused prior to treatment and disposal. For the purpose of this Wastewater Feasibility Study, the Recycling program will not be taken into account with regards to projected PW flows.

The proposed new wastewater management system described above and herein will be adequate to treat and dispose of the projected SW and PW flows generated from the proposed use. To assist you in the evaluation of the above conclusions, the following information is enclosed:

Attachment I: Wastewater System Flow Diagram

Attachment II: Wastewater System Design Criteria, Evaluation, & Calculations

In addition, please refer to the Use Permit site plan for the locations of the proposed SW and PW wastewater system components. The plan indicates the relative locations of buildings, roads, wastewater primary and expansion leachfields, and other site features that would be required for this project.

The attached information regarding the proposed improvements should be sufficient for review at the Use Permit level. If you have any questions or require further information, please feel free to contact me at (707) 824-0266.

Sincerely,

Tamara Martin, R.E.H.S.

cc: Ted Hall, Long Meadow Ranch

Attachments

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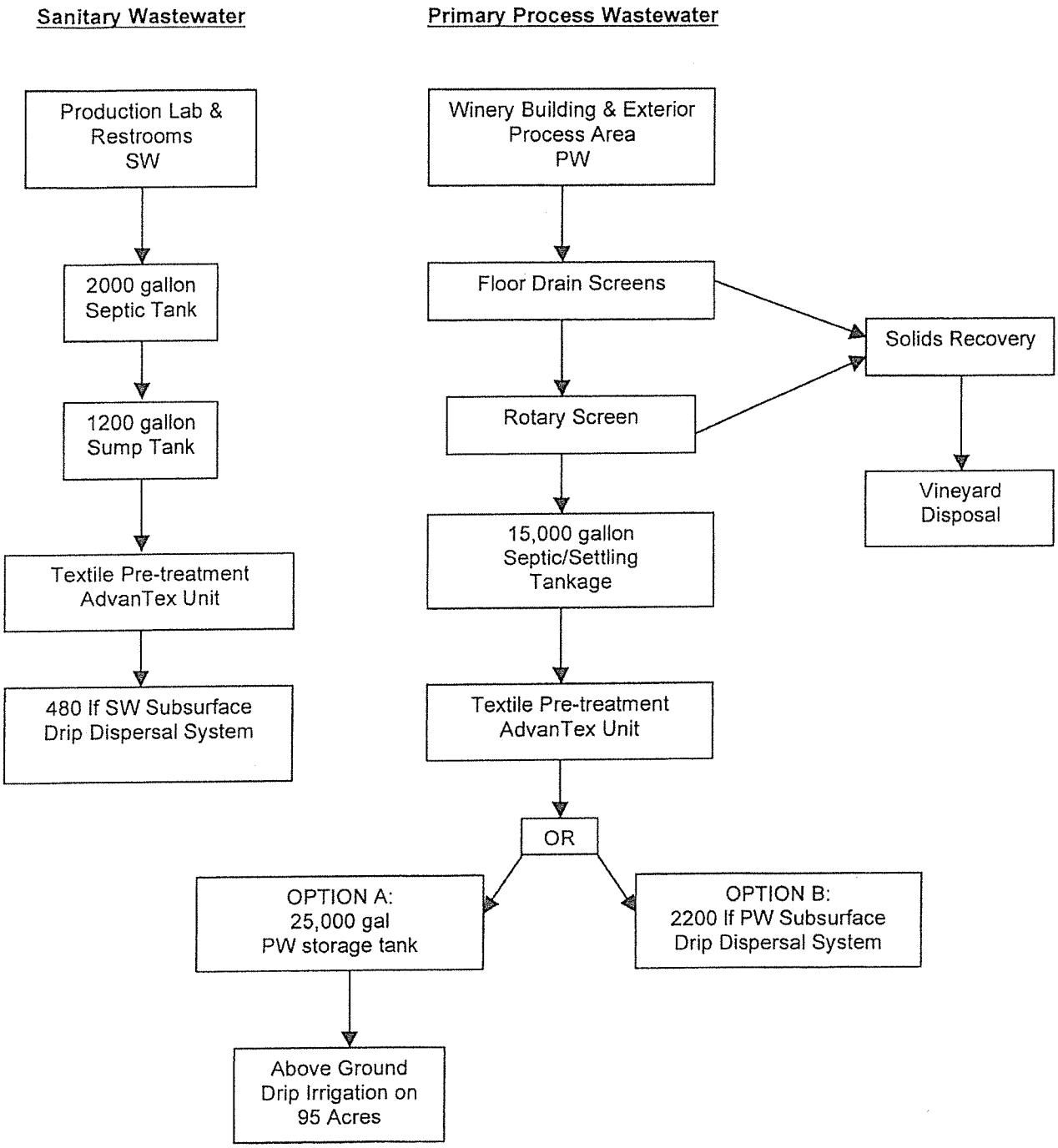
ATTACHMENT I

SANITARY & PROCESS WASTEWATER MANAGEMENT SYSTEM FLOW DIAGRAM

SANITARY & PROCESS WASTEWATER MANAGEMENT SYSTEM FLOW DIAGRAM



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ATTACHMENT II

SANITARY & PROCESS WASTEWATER MANAGEMENT SYSTEM DESIGN CRITERIA, EVALUATION, AND CALCULATIONS

LONG MEADOW RANCH
RUTHERFORD WINERY
1790 St. Helena Highway
Rutherford, California
APN 030-100-016

WASTEWATER MANAGEMENT SYSTEM
DESIGN CRITERIA & EVALUATION

SANITARY WASTEWATER

Sanitary wastewater (SW) at the winery will consist of typical wastewater generated from sinks, glassware dishwashers, restrooms and laboratory facilities. The facility will not be open to the public for tours and tasting, but tasting room or wine club visitors and business or marketing visitors will be by appointment only. Special events will be catered and as such, flows associated with catered events would not include any kitchen waste or dishwashing. As a result, a flow of 4 gpd per event guest will be used. Anticipated SW flows are projected as follows:

AVERAGE DAY:

6 full-time employees x 15 gpcd	=	90
5 tasting or business visitors x 3 gpcd	=	15
Total	=	105 gpd

AVERAGE DAY W/ TRADE EVENT:

10 full-time employees x 15 gpcd	=	150
20 marketing visitors x 3 gpcd	=	60
Total	=	210 gpd

AVERAGE DAY W/ SPECIAL EVENT:

10 full-time employees x 15 gpcd	=	150
100 event guests w/catered meals x 4 gpcd	=	400
Total	=	550 gpd

HARVEST WEEKDAY:

10 full-time employees x 15 gpcd	=	150
3 part-time employees x 7.5 gpcd	=	22.5
50 tasting visitors x 3 gpcd	=	150
Total	=	322.5 gpd

HARVEST DAY W/ EVENT:

10 full-time employees x 15 gpcd	=	150
3 part-time employees x 7.5 gpcd	=	22.5
100 event guests with meals x 4 gpcd	=	400
Total	=	572.5 gpd
Design SW flow	=	**573 gpd SW**

SW SEPTIC TANK

Sanitary Wastewater Tank:

Size for peak day (harvest weekend day w/ event):
V = 1,125 gal + (.75) x Q
= 1,125 gal + (.75) x (573 gpd)
= 1,554.75 gallons

To allow for additional settling of solids, we recommend installing a 2000-gallon septic & processing tank. Based on a total of 2000 gallons of septic tankage, the resulting detention time for a peak day flow would be 3.5 days. The AdvanTex textile filter will be installed in conjunction with the second compartment of the septic tank. The SW effluent will then gravity flow to the SW sump tank where it will be time dosed to the subsurface drip field.

SW SUBSURFACE DRIP DISPERSAL SYSTEM

A site evaluation with the Napa County Department of Environmental Management (NCDEM) was conducted on July 10, 2006. Profile pits 1 through 7 revealed 24" to 30" of Sandy Loam and Sandy Clay Loam. Mottling at 24" in profile pit 3, and at 30" in all other profile pits indicated that high ground water was the limiting condition for wastewater treatment and disposal. The two possible sanitary wastewater systems for this site would be an above ground mound system or a subsurface drip dispersal system. Based on the fact that a mound system would necessitate removal of vines, it is proposed to install a subsurface drip dispersal system. With installation of a drip system, the vines would not necessarily need to be removed, but no disking would be allowed in the leachfield area. Cover crop and mowing would be necessary for the vineyard in the area of the subsurface drip system.

Based on a moderate to strong Sandy Clay Loam, the drip system will be sized with an application rate of 0.6 g/sf/d. The primary drip system will be located in the vicinity of profile pits 4 and 5 and the 200% reserve area will be located adjacent to the primary system and in the vicinity of profile pit 3.

Primary SW Drip Design Criteria:

- Hydraulic Loading Rate = 0.6 gallons/s.f./day
- Design Flow = 573 gpd
- Depth of drip lines = 6" into existing grade

Primary SW Drip System Leachfield:

- Total Square footage required = 955 sf
- Total Square footage provided = 955 sf
- Spacing of Drip lines = 2' o.c.
- Spacing of Drip emitters = 2' o.c.
- Length of each Wasteflow line = 94 lf
- Total linear feet of Wasteflow lines required = 478 lf
- Total linear feet of Wasteflow lines provided = 480 lf (5 – 96 lf lines)

(SEE Attachments for SANITARY WASTEWATER Subsurface Dripline Dispersal Field Calculations)

Reserve SW Drip Design Criteria:

- Hydraulic Loading Rate = 0.6 gallons/s.f./day
- Design Flow = 573 gpd x 2 = 1146 gpd
- Depth of drip lines = at existing grade (with fill material)

200% Reserve SW Drip System Leachfield:

- Total Square footage required = 1910 sf
- Total Square footage provided = 1910 sf
- Spacing of Drip lines = 2' o.c.
- Spacing of Drip emitters = 2' o.c.
- Length of each Wasteflow line = varies
- Total linear feet of Wasteflow lines required = 956 lf
- Total linear feet of Wasteflow lines provided = 956 lf

PROCESS WASTEWATER

Process wastewater (PW) will be generated from typical winery processing activities including crushing, fermentation, barrel storage and bottling with tank, barrel, equipment and floor cleaning. There is currently proposed to be approximately 606 tons of grapes crushed, produced and bottled onsite (corresponding to 100,000 gallons of wine). Only wine processing will occur at the facility; no distilling operations will occur.

Based on historical and typical flow data from wineries of similar size and characteristics, as well as from the physical limitations of the proposed Long Meadow Ranch Rutherford Winery processing space, the corresponding PW generation rates and calculated projected PW flows are as follows:

PW FLOWS

Total annual gallons of wine produced on site = 100,000 gallons

Gallons of red wine produced on site = 30,000 gallons

Gallons of white wine produced on site = 70,000 gallons

Generation rate for red wine = 5.0 gal PW/gal

Generation rate for white wine = 4.0 gal PW/gal

Annual Volume Red Wine = 30,000 gal wine x 5.0 gal PW/gal wine = 150,000 gal PW

Annual Volume White Wine = 70,000 gal wine x 4.0 gal PW/gal wine = 280,000 gal PW

Total Annual Volume = 150,000 gal PW red wine + 280,000 gal PW white wine = 430,000 gal PW total

AVERAGE DAY FLOW:

430,000 gal PW ÷ 365 days = 1,178 gpd PW

AVERAGE DAY HARVEST FLOW:

Generation rate = 1.0 gal PW/gal wine

$$\frac{\text{100,000 gallons wine x 1.0 gal PW/gal wine}}{\text{60 days}} = \text{1,667 gpd PW}$$

PEAK WEEK HARVEST DAY FLOW:

Generation rate = 0.75 gal PW/gal wine

Peak week tonnage = 60 tons / peak week

Peak day tonnage = 20 tons

20 tons grapes crushed/day x 165 gal wine/ton grapes crushed x 0.75 gal PW/gal wine = 2475 gpd PW

Design PW flow = 2475 gpd PW

PW SEPTIC TANK

The required total septic tank size for the projected PW flows based on the Manual of Septic Tank Practice is as follows:

Volume = 1.5 x Q
= 1.5 x 2475 gpd
= 3,712.5 gallons

However, based on past analysis and testing of anaerobic treatment at numerous wineries, the appropriate detention time for sufficient anaerobic treatment is 5 days.

Volume = 5 days detention x Peak Harvest Day Flow
=5 x 2475 gpd
= 12,375 gallons

Two 5,000 gallon septic tanks and one 5,000 gallon single compartment septic/recirculation tank shall be installed for a total of 15,000 gallons of septic tankage. This volume of tankage will allow for additional settling of solids with a resulting minimum detention time of approximately 12.7 days, 9.0 days and 6.1 days for the average day, average harvest day and peak week harvest day, respectively.

PW TREATMENT & DISPOSAL

Two different options for treatment and disposal are discussed in this Wastewater Feasibility Study. The first option (Option A) would be to treat the PW with a package treatment plant, hold the PW in a storage tank, and dispose of it via drip irrigation of the existing vineyard. The second option (Option B) is to dispose of the process wastewater in a subsurface drip disposal system in the vicinity of profile pits 6 and 7. The 200% reserve area would be disposed of in the vicinity of profile pits 1 and 2. This system would be sized with the same application rate as the sanitary system, although would be larger due to the projected flows.

With both options, the PW is proposed to be treated by the commercial grade AdvanTex AX-100 textile pods manufactured by Orenco Systems, Inc. The AdvanTex treatment system is a packed bed textile filter that supports attached growth biological treatment. In addition, the system includes pumps, filtered pump vault, and valves. A control panel with remote telemetry capabilities will assist in the monitoring of the system.

For option A (drip irrigation of vineyard), the treated PW effluent will be pumped to a storage tank where a small aerator or ozonator will be placed to keep the treated effluent polished and prevent potential septic conditions during long periods of storage. During periods of rain and/or when saturated soil conditions exist, the irrigation system cannot operate. A 25,000 gallon storage tank will provide 20 days of storage for the average day flow. During dry conditions, the PW will be pumped from the storage tank, filtered and discharged via vineyard irrigation with above ground drip lines.

The final reuse of the treated PW effluent (reclaimed wastewater) will be accomplished by drip irrigation of approximately 90 acres of contiguous vineyard. Backflow prevention devices will be installed on the irrigation equipment to prevent cross contamination of any potable water sources. The irrigation demand of the vines and the percolation of the on-site soils exceeds the estimated annual process wastewater volume for proposed production. The irrigation demand is lowest during the rainy season. Additionally, winemaking activities require less water during the rainy, non-harvest, season. (See attached IRRIGATION & EFFLUENT APPLICATION RATES and ASSIMILATIVE CAPACITY)

For option B (subsurface drip dispersal), the treated PW will be time dosed to a subsurface drip dispersal system located in the vicinity of profile pits 6 and 7. (See PW SUBSURFACE DRIP DISPERSAL SYSTEM BELOW)

PW SUBSURFACE DRIP DISPERSAL SYSTEM

Primary PW Drip Design Criteria:

- Hydraulic Loading Rate = 0.6 gallons/s.f./day
- Design Flow = 2475 gpd
- Depth of drip lines = 6" into existing grade

Primary PW Drip System Leachfield:

- Total Square footage required = 4125 sf
- Total Square footage provided = 4125 sf
- Spacing of Drip lines = 2' o.c.
- Spacing of Drip emitters = 2' o.c.
- Length of each Wasteflow line = 200 lf
- Total linear feet of Wasteflow lines required = 2062.5 lf
- Total linear feet of Wasteflow lines provided = 2200 lf (11 – 200 lf lines)

(SEE Attachments for PROCESS WASTEWATER Dripline Dispersal Field Calculations)

200% Reserve PW Drip Design Criteria:

- Hydraulic Loading Rate = 0.6 gallons/s.f./day
- Design Flow = 2475 gpd x 2 = 4950 gpd
- Depth of drip lines = 6" into existing grade

Primary PW Drip System Leachfield:

- Total Square footage required = 8250 sf
- Total Square footage provided =8250 sf
- Spacing of Drip lines = 2' o.c.
- Spacing of Drip emitters = 2' o.c.
- Length of each Wasteflow line = 200 lf
- Total linear feet of Wasteflow lines required = 4125 lf
- Total linear feet of Wasteflow lines provided = 4125 lf

GEOFLOW SUBSURFACE DRIP

Field Flow

Job Description:	*Long Meadow Ranch Rutherford Winery SANITARY WASTEWATER*
Contact:	*Tammy Martin, REHS*
Prepared by:	*RAM Engineering*
Date:	*25-Jul-13*

Please fill in the shaded areas and drop down menus:
This spreadsheet serves as a guide, and is not a complete hydraulic design.

Worksheet 1- Field Flow

Total field

	Total Quantity of effluent to be disposed per day	573	gallons / day
	Hydraulic loading rate	0.6	gallons / sq.ft. / day
	Minimum Dispersal Field Area	955	square ft.
	Total Dispersal Field Area	955	square ft.

Flow per zone

Number of Zones		1	zone(s)
	Dispersal area per zone	955	square ft.
	Choose line spacing between WASTEFLOW lines	2	ft.
	Choose emitter spacing between WASTEFLOW emitters	2	ft.
	Total linear ft. per zone (minimum required)	478	ft. per zone
	Total number of emitters per zone	239	emitters per zone
	Select Wasteflow dripline (16mm)	Wasteflow PC - 1/2gph	dripline
	Pressure at the beginning of the dripfield	20	psi
	Feet of Head at the beginning of the dripfield	46.2	ft.
	What is the flow rate per emitter in gph?	0.53	gph
	Dose flow per zone	2.11	gpm

Note: A few States or Counties require additional flow for flushing. Please check your local regulations.
Flush velocity calculation below is for PC dripline. Classic dripline requires less flow to flush than PC.
Please, refer to Geoflow's spreadsheet "Design Flow and Flush Curves" at www.geoflow.com or call 800-828-3388

	If required, choose flush velocity	2	ft/sec
	How many lines of WASTEFLOW per zone?	4	lines
	Fill in the *actual* length of longest dripline lateral	94	ft.
	Flush flow required at the end of each dripline	1.48	gpm
	Total Flow required to achieve flushing velocity	5.92	gpm
	Total Flow per zone- worst case scenario	8.03	gpm

Select Filters and zone valves

	Select Filter Type	BioDisc Filter	
	Recommended Filter (item no.)	BioDisc-150	1.5" Disc Filter 0-30gpm
	Select Zone Valve Type	Electric Solenoid	-
	Recommended Zone Valve (item no.)	0	0

Dosing

	Number of doses per day / zone:	12	doses
	Timer ON. Pump run time per dose/zone:	22.38	mins:secs
	Timer OFF. Pump off time between doses	1:37	hrs:mins
	Per Zone - Pump run time per day/zone:	4:31	hrs:mins
	All Zones - Number of doses per day / all zones	12	doses / day

RAM ENGINEERING Sebastopol, CA	*Long Meadow Ranch Rutherford Winery* Irrigation & Effluent Application Rates	PROJECT 2013002 DATE: 3/12/13 BY: SMM CHK: ____ SHEET OF

MONTH	ETo	Kc GRASS	ET	PPT	IRRIGATION DEMAND		PERCOLATION APPLIED		ASSIMILATIVE CAPACITY		EFFLUENT APPLIED		EXCESS CAP.
	IN	Constant	IN	IN	IN	MG	IN	MG	IN	MG	MG	IN	MG
January	0.8	0.00	0.00	7.56	0.00	0.000	0.15	0.016	0.15	0.016	0.022	0.203	-0.006
February	1.2	0.00	0.00	6.11	0.00	0.000	0.20	0.022	0.20	0.022	0.031	0.285	-0.009
March	2.4	0.00	0.00	5.04	0.00	0.000	0.20	0.022	0.20	0.022	0.029	0.267	-0.007
April	3.4	0.16	0.54	2.37	0.00	0.000	0.15	0.016	0.15	0.016	0.024	0.217	-0.007
May	5.0	0.58	2.90	1.13	1.77	0.192	0.00	0.000	1.77	0.192	0.020	0.184	0.172
June	5.9	0.71	4.19	0.33	3.86	0.420	0.00	0.000	3.86	0.420	0.029	0.267	0.391
July	7.1	0.64	4.54	0.05	4.50	0.489	0.00	0.000	4.50	0.489	0.037	0.341	0.452
August	6.2	0.45	2.79	0.08	2.71	0.295	0.00	0.000	2.71	0.295	0.059	0.543	0.236
September	4.6	0.26	1.20	0.51	0.69	0.075	0.00	0.000	0.69	0.075	0.070	0.645	0.005
October	2.7	0.07	0.19	2.09	0.00	0.000	0.30	0.033	0.30	0.033	0.044	0.405	-0.011
November	1.2	0.00	0.00	4.42	0.00	0.000	0.25	0.027	0.25	0.027	0.033	0.304	-0.006
December	0.7	0.00	0.00	6.56	0.00	0.000	0.25	0.027	0.25	0.027	0.035	0.322	-0.008
TOTAL	41.2		16.35	36.25	13.53	1.47	1.50	0.16	15.03	1.63	0.43	3.98	1.20

IRRIGATION AREA = 4

NOTES:

1 ET_o values based on evaporation values in Table 5-1, "Irrigation with Reclaimed Municipal Wastewater - A Guidance Manual" - California State Water Resources Control Board, July, 1984. Values are for "North Coast - Interior Valleys".

2 Kc coefficients for pasture grass from Table 5-12, reference cited above.

3 $ET=ET_o \times Kc$

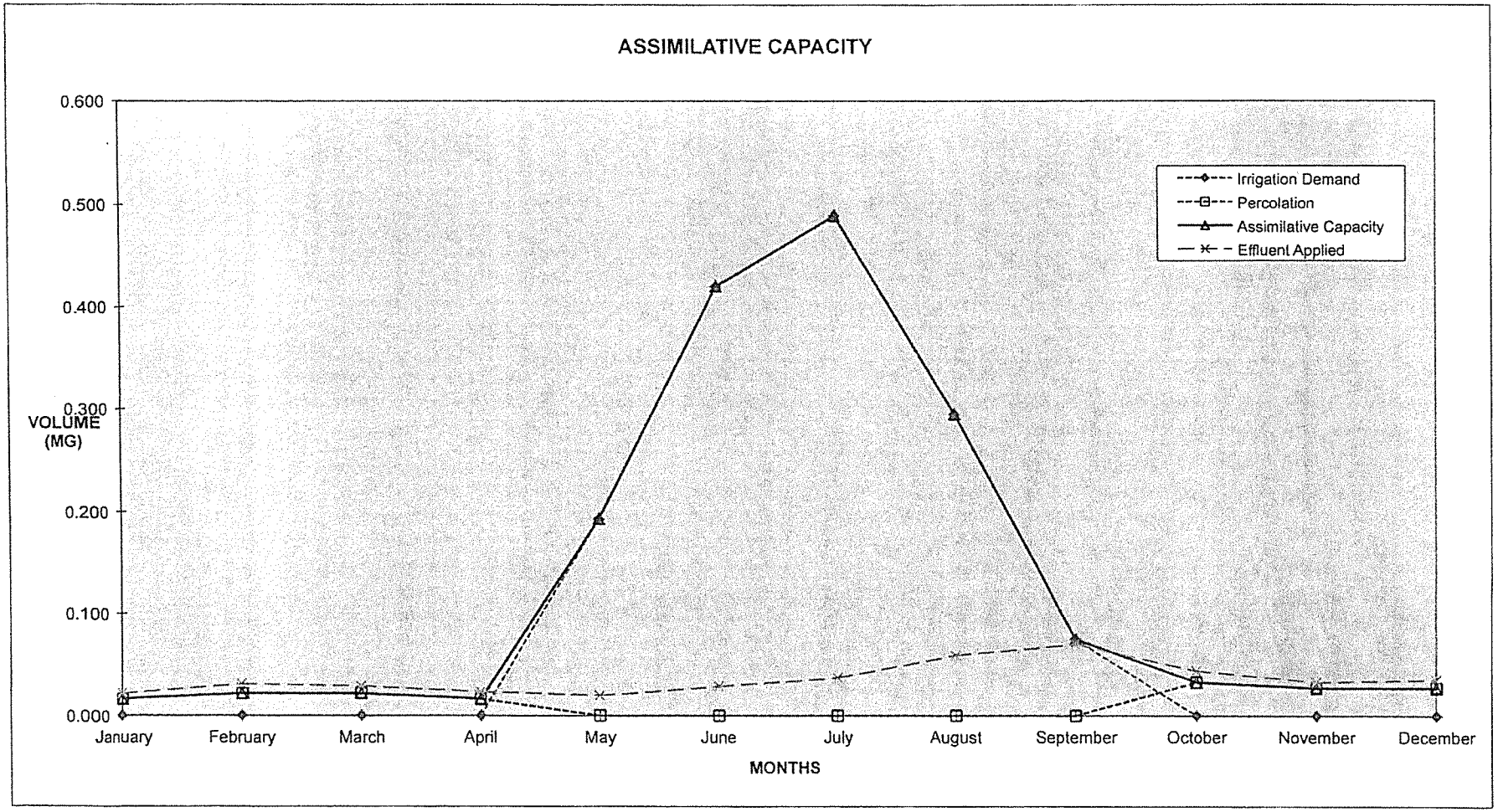
4 Precipitation, 10-year rainfall event, based upon rainfall data for Sonoma-Napa, California

5 Irrigation Demand = ET-PPT, inches

6 Design percolation rate is a maximum 1.0 inches per month for October. Conservatively, percolation for the months of May through September is not utilized.

7 Volumes estimated using 4 acres of irrigation. Assimilative capacity is the sum of irrigation demand and percolation applied.

There exists a total of 95 contiguous acres of vineyard available for drip irrigation of the treated PW.



GEOFLOW SUBSURFACE DRIP

Field Flow

Job Description:	*Long Meadow Ranch Rutherford Winery PROCESS WASTEWATER*
Contact:	*Tammy Martin, REHS*
Prepared by:	*RAM Engineering*
Date:	*12-Mar-13*

Please fill in the shaded areas and drop down menus:
This spreadsheet serves as a guide, and is not a complete hydraulic design.

Worksheet 1- Field Flow

Total field

	Total Quantity of effluent to be disposed per day	2,475	gallons / day
	Hydraulic loading rate	0.6	gallons / sq.ft. / day
	Minimum Dispersal Field Area	4,125	square ft.
	Total Dispersal Field Area	4,125	square ft.

Flow per zone

Number of Zones		1	zone(s)
	Dispersal area per zone	4,125	square ft.
	Choose line spacing between WASTEFLOW lines	2	ft.
	Choose emitter spacing between WASTEFLOW emitters	2	ft.
	Total linear ft per zone (minimum required)	2,063	ft. per zone
	Total number of emitters per zone	1,031	emitters per zone
	Select Wasteflow dripline (16mm)	Wasteflow PC - 1/2gph	dripline
	Pressure at the beginning of the dripfield	20	psi
	Feet of Head at the beginning of the dripfield	46.2	ft.
	What is the flow rate per emitter in gph?	0.53	gph
	Dose flow per zone	9.11	gpm

Note: A few States or Counties require additional flow for flushing. Please check your local regulations.
Flush velocities in calculation below is for PC dripline. Classic dripline requires less flow to flush than PC.
Please refer to Geoflow's spreadsheet 'Design Flow and Flush Curves' at www.geoflow.com or call 800-828-2255

	If required, choose flush velocity	2	ft/sec
	How many lines of WASTEFLOW per zone?	3	lines
	Fill in the *actual* length of longest dripline lateral	100	ft.
	Flush flow required at the end of each dripline	1.48	gpm
	Total Flow required to achieve flushing velocity	4.44	gpm
	Total Flow per zone- worst case scenario	13.55	gpm

Select Filters and zone valves

	Select Filter Type	BioDisc Filter	
	Recommended Filter (item no.)	BioDisc-150	1.5" Disc Filter 0-30gpm
	Select Zone Valve Type	Electric Solenoid	-
	Recommended Zone Valve (item no.)	0	0

Dosing

	Number of doses per day / zone:	12	doses
	Timer ON. Pump run time per dose/zone:	22.38	mins:secs
	Timer OFF. Pump off time between doses	1:37	hrs:mins
	Per Zone - Pump run time per day/zone:	4:31	hrs:mins
	All Zones - Number of doses per day / all zones	12	doses / day

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Water System Feasibility Report
for
Long Meadow Ranch Rutherford Winery

1790 St. Helena Highway
Rutherford, California
APN 030-100-016

March 29, 2013

RAM Engineering
Wastewater and Civil Engineering

The Long Meadow Ranch Rutherford Winery will require a Transient Non-Community State Water System Permit. This report has been prepared to address the feasibility of such a permitted system for review at the Use Permit level.

The subject property currently has an existing well on site. A Well Pump Test has been conducted by Oakville Pump, Inc. and a preliminary Water Quality Report has been prepared by National Testing Laboratories, Ltd. However, the existing well does not have a 50' concrete annular seal. As a result, a new well will be drilled to serve the proposed new winery facility. For the purpose of this study, some information regarding the older, existing well on site may be used.

The following is an abbreviated TMF Capacity Summary to assist in the review of this proposed new water system:

1. The Water System is proposed to be named:
    a. The Long Meadow Ranch Rutherford Winery Water System
2. This report is being prepared by Tamara Martin, REHS of RAM Engineering.
3. Technical Capacity:
    a. The system is proposed to consist of a well, a 10,000 gallon storage tank and then distribution to the winery buildings and hospitality pavilion area. There will likely be three forms of treatment provided: ultraviolet lights, water softener, and reverse osmosis. It is important to note that there is not a long standing history of positive bacteriological testing that will necessitate the uv treatment, therefore, it will likely be incorporated as a precautionary measure only. (Note: All Water Quality results submitted with this report are for the existing well. Lab results for the new well will be provided upon completion of well drilling.)
    b. The subject property does not have existing or future vineyards. From the Phase 1 Water Availability Analysis prepared by this office, the projected annual water usage will be 16.89 acre-feet per year (5,503,116.6 gallons annually). The new well is expected to more than adequately meet these projected water usage needs over the next 10 years.
    c. The new well will be constructed with a 50' annular seal and is expected to comply with the surface water treatment rule.
    d. The existing well yields 22 gpm, and a new well is projected to yield a similar result. A yield of 22 gpm would accommodate 3 gpm for each connection over a 24 hour period.
    e. As mentioned above, water quality lab results are only available for the existing well. There were no contaminants noted above the EPA enforceable MCL, however, the results showed elevated levels of Aluminum, Iron, and Manganese. Additionally, water hardness, pH, and turbidity may also be of concern.
    f. It is not planned, nor financially feasible, to consolidate with any other public water systems.
4. Managerial Capacity:
    a. The proposed new water system will be managed by the winemaker on

site. The winemaker will be responsible for the establishing of policies to ensure compliance with the state regulatory drinking water requirements. Due to the limited manpower required to operate this proposed water system, the amount of time allocated to operations is very small in comparison to winemaking duties. However, the winemaker will be trained to operate the UV light treatment system, the water softener, as well as the Reverse Osmosis system.

b. The well is located on the subject property which is owned by Long Meadow Ranch.

5. Financial Capacity:
   a. No revenue will be generated by this Transient non-community Water System. The cost of operating this system will include routine maintenance, required quarterly sampling, and an annual operating permit issued by Napa County. According to Gene Broderick, of Northcoast Water Works, the projected cost of routine maintenance for a water system with UV disinfection, water softener, and RO is approximately $600 year. Based on Quarterly water quality testing at $50 per analysis, the annual cost for sampling would be $200. The Napa County Department of Environmental Management charges $661 per year for an Annual Operating Permit. Consequently, a five year Budget Projection shows a cost of $1461 per year or $7305 for the next five years total.

Oakville Pump Service, Inc.

P.O. Box 435
Oakville, Ca 94562
Phone (707) 944-2471 Fax (707) 944-5636
Lic.# 744958

Well Report For:

July 25, 2012

Long Meadow Ranch
Attn: Pacific Union - Elliott
738 Main Street
St. Helena, Ca 94574

Job Number: 12G-4353
Well Address: 1790 St. Helena Hwy, Rutherford

The well test and it's report are completed and the graphed results are on the reverse side of this sheet.

The well yield is approximately >>>>>>>>>>>>: 22 GPM.
(For the period of time noted on the graph)

I. Graph Information

- Top Line (Square boxes): Represents the relationship between the amount of Water that is being pumped and the time element. This is measured in GPM (gallons per minute)
- Middle line (diamonds): Represents a clarity scale. This scale is subjective with a base of 10 as dirty & 0 as clear. The water clarity and turbidity is noted on this scale.
- Bottom line (triangles): Represents the water level in the well, in relationship to the gallons pumped.
- In evaluating this information the relationship between the graphed parameters is important. This relationship indicates whether the water level in the well is dropping or on the rise at any certain time, and pumping amount. The clarity scale indicates the turbidity of the aquifer in relationship to the pumping amount and water level in the well.

II. Well information (approx.)

Well Depth:	Not Available	Pump Size:	1 hp @ 9.0 amps
Static Water Level:	22'	Pump Setting:	Not Available
Casing Size:	8"	Draw down:	-12'
Casing Type:	Steel	Recovery:	10'
		Gallons Pumped:	5180

III. System Inspection

Well Pump Op:	Functional	Storage Tank(s):	Not Applicable
Electrical Equip:	See Below	Pressure Tank(s):	WX-302 - Functional
Plumbing:	1-1/4" Galv.	Booster Pump Op:	Not Applicable
Well Seal:	Functional	Filter System:	See Below
Low Water Protection:	MotorSaver Sp231	Pressure Relief Valve:	Yes

IV. Water Quality & Potability testing:

If any water samples were taken, the results will be available within the specified time that was requested and will be sent at that time.

V. Comments & Observations:

- Electrical Equipment: The existing electrical service from the breaker to the well is in poor condition and should be updated. The pump is powered by two different single pole breakers and the power is supplied by overhead Romex cable that has extensive sun damage.
- Water Quality: Water Samples were sent out for Mineral Analysis. During the test there was heavy amounts of sand that was being pumped out along with the water. This creates wear and tear on the pump and will cause clogging of emitters and plumbing in the system.

- Well Casing: Due to the amount of sand coming out of the well during the test, we suspect that the steel casing may have a hole that is allowing the sand to enter the well. The well can be re-cased with new well packing installed between the old and new casing, this should substantial reduce the amount of sand, but may not stop it entirely.
In addition, the existing well casing is only 2" off the concrete pad and should be higher to prevent contamination. Recasing the well would raise the wellhead off the pad by at least 12".

Thank you for letting us be of service. If there are any questions or comments please call.

Nicholaus Lutz

Informational Water Quality Report

Watercheck 1 & 2

Client:
Long Meadow Ranch 1790 St. Helena Highway Rutherford, CA

Ordered By:
Oakville Pump #1 Walnut Drive Oakville, CA 94562 ATTN: Kelly Takacs

National Testing Laboratories, Ltd.
Quality Water Analysis
6571 Wilson Mills Rd
Cleveland, Ohio 44143
1-800-458-3330

Sample Number: 829590

Location:	LMR
Type of Water:	Other
Collection Date and Time:	
Received Date and Time:	7/27/2012 09:00
Date Completed:	8/2/2012

Ground Well Water

Definition and Legend

This informational water quality report compares the actual test result to national standards as defined in the EPA's Primary and Secondary Drinking Water Regulations.

Primary Standards:	Are expressed as the maximum contaminant level (MCL) which is the highest level of contaminant that is allowed in drinking water. MCLs are enforceable standards.
Secondary standards:	Are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor,or color) in drinking water. Individual states may choose to adopt them as enforceable standards.
Action levels:	Are defined in treatment techniques which are required processes intended to reduce the level of a contaminant in drinking water.
mg/L (ppm):	Unless otherwise indicated, results and standards are expressed as an amount in milligrams per liter or parts per million.
Minimum Detection Level (MDL):	The lowest level that the laboratory can detect a contaminant.
ND:	The contaminant was not detected above the minimum detection level.
NA:	The contaminant was not analyzed.


The contaminant was not detected in the sample above the minimum detection level.


The contaminant was detected at or above the minimum detection level, but not above the referenced standard.


The contaminant was detected above the standard, which is not an EPA enforceable MCL.


The contaminant was detected above the EPA enforceable MCL.


These results may be invalid.

Status	Contaminant	Results	Units	National Standards		Min. Detection Level
			Inorganic Analytes - Metals			
△	Aluminum	0.3	mg/L	0.2	EPA Secondary	0.1
✓	Arsenic	ND	mg/L	0.010	EPA Primary	0.005
✓	Barium	ND	mg/L	2	EPA Primary	0.30
✓	Boron	ND	mg/L	--		0.10
✓	Cadmium	ND	mg/L	0.005	EPA Primary	0.002
●	Calcium	32.1	mg/L	--		2.0
✓	Chromium	ND	mg/L	0.1	EPA Primary	0.010
●	Copper	0.008	mg/L	1.3	EPA Action Level	0.004
△	Iron	0.701	mg/L	0.3	EPA Secondary	0.020
✓	Lead	ND	mg/L	0.015	EPA Action Level	0.002
●	Magnesium	41.97	mg/L	--		0.10
△	Manganese	0.082	mg/L	0.05	EPA Secondary	0.004
✓	Mercury	ND	mg/L	0.002	EPA Primary	0.001
✓	Nickel	ND	mg/L	--		0.020
✓	Potassium	ND	mg/L	--		1.0
✓	Selenium	ND	mg/L	0.05	EPA Primary	0.020
●	Silica	27.0	mg/L	--		0.1
✓	Silver	ND	mg/L	0.100	EPA Secondary	0.002
●	Sodium	16	mg/L	--		1
●	Zinc	0.016	mg/L	5	EPA Secondary	0.004
			Physical Factors			
●	Alkalinity (Total as CaCO3)	220	mg/L	--		20
✓	Carbonate (as CaCO3)	ND	mg/L	--		20
●	Conductivity	520	umhos/cm	--		1
✓	Corrosivity	-1.201	SI	--		
△	Hardness	250	mg/L	100	NTL Internal	10
✓	Hydroxide (as CaCO3)	ND	mg/L	--		20

Status	Contaminant	Results	Units	National Standards		Min. Detection Level
△	pH	6.4	pH Units	6.5 to 8.5	EPA Secondary	
●	Total Dissolved Solids	310	mg/L	500	EPA Secondary	20
△	Turbidity	3.3	NTU	1.0	EPA Action Level	0.1
			Inorganic Analytes - Other			
●	Chloride	14.0	mg/L	250	EPA Secondary	5.0
✓	Fluoride	ND	mg/L	4.0	EPA Primary	0.5
✓	Nitrate as N	ND	mg/L	10	EPA Primary	0.5
✓	Nitrite as N	ND	mg/L	1	EPA Primary	0.5
✓	Ortho Phosphate	ND	mg/L	--		2.0
●	Sulfate	45.0	mg/L	250	EPA Secondary	5.0

We certify that the analyses performed for this report are accurate, and that the laboratory test were conducted by methods approved by the U.S. Environmental Protection Agency or variations of these EPA methods.

These test results are intended to be used for informational purposes only and may not be used for regulatory compliance.

National Testing Laboratories, Ltd.

NATIONAL TESTING LABORATORIES, LTD