MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager

From: Joel Jeffrey, Well Construction Program Coordinator

Subject: Review of Limited License Application LL-1799

Date: December 12, 2019

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Ben Scandella and Jen Woody reviewed the application. Please see Ben and Jen's Groundwater Review and the Well Log.

Applicant's Well #1 (POLK 1036): Based on a review of the Well Report, Applicant's Well #1 does not appear to comply with current minimum well construction standards (See OAR 690 Division 210). The well report indicates that the well was sealed to a depth of 39 feet below land surface. In order to meet minimum well construction standards, the well must be re-cased and re-sealed to a minimum depth of 171 feet below land surface.

My recommendation is that the Department **not issue** a limited license for Applicant's Well #1 unless it is brought into compliance with current minimum well construction standards or information is provided showing that it is in compliance with current minimum well construction standards.

The repair of Applicant's Well #1 may not satisfy hydraulic connection issues.

superseded

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager

From: Joel Jeffrey, Well Construction Program Coordinator

Subject: Review of Limited License Application LL-1799

Date: November 26, 2019

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Ben Scandella and Jen Woody reviewed the application. Please see Ben and Jen's Groundwater Review and the Well Log.

Applicant's Well #1 (POLK 1036): Based on a review of the Well Report, Applicant's Well #1 does not appear to comply with current minimum well construction standards (See OAR 690 Division 210). The well report indicates that the well was sealed to a depth of 39 feet below land surface. In order to meet minimum well construction standards, the well must be re-cased and re-sealed to a minimum depth of 171 feet below land surface,

The repair of Applicant's Well #1 may not satisfy hydraulic connection issues.

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the

WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

POLK 1036

State Well No. 6S/3W-18 bb

State Permit No. .....

(1) OWNER:
Name MR. DOUG BENNETT
Address 3700 BETHEL HTS. RD.
SALEM, ORE. 97304

(2) TYPE OF WORK (check):
New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary [X] Driven [ ]
Cable [ ] Jetted [ ]
[ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [X] Industrial [ ] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]

(5) CASING INSTALLED:
Threaded [ ] Welded [X]
6 " Diam. from +1 ft. to 39 ft. Gage .250
4 " Diam. from -10 ft. to 320 ft. Gage .188
" Diam. from ..... ft. to ..... ft. Gage .....

(6) PERFORATIONS:
Perforated? [X] Yes [ ] No.
Type of perforator used SAW
Size of perforations 1/8 in. by 6 in.
LINER 21 perforations from 280 ft. to 310 ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

(7) SCREENS:
Well screen installed? [ ] Yes [X] No
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? AIR [X] Yes [ ] No If yes, by whom? SNEED
ld: 20 gal./min. with 97 ft. drawdown after 2 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
esian flow g.p.m.
emperature of water 57° Depth artesian flow encountered ..... ft.

(9) CONSTRUCTION:
Well seal—Material used CEMENT
Well sealed from land surface to 39 ft.
Diameter of well bore to bottom of seal 10 in.
Diameter of well bore below seal 6 in.
Number of sacks of cement used in well seal 8 sacks
How was cement grout placed? CEMENT PUMP
Was a drive shoe used? [X] Yes [X] No Plugs N.O. Size: location ..... ft.
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? [ ] Yes [X] No Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

(10) LOCATION OF WELL:
County POLK Driller's well number
NW ¼ NW¼ Section 18 T. 6S R. 3W W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 290 ft.
Static level 223 ft. below land surface. Date 5-12-80
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 6"
Depth drilled 328 ft. Depth of completed well 320 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
TOP SOIL	0	2	
BASALT WEATH/BOULDERS	2	20	
" DENSE	20	22	
" WEATH	22	30	
" DENSE	30	56	
" WEATH	56	95	
" BROKEN	95	106	
" DENSE	106	115	
" SEAMY	115	166	
" DENSE	166	289	
" DECOMPOSED	289	311	223
" SEAMY	311	318	
" DENSE	318	320	

RECEIVED
MAY 19 1980
WATER RESOURCES DEPT
SALEM, OREGON

Work started 4-30 19 80 Completed 5-12 19 80
Date well drilling machine moved off of well 5-12 19 80

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] J. R. Sneed (Drilling Machine Operator) Date 5-14, 19 80
Drilling Machine Operator's License No. 940

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name R-7 SNEED WELL DRILLING (Person, firm or corporation) (Type or print)
Address 4750 ELIZABETH N. SALEM ORE
[Signed] R-7 Sneed (Water Well Contractor)
Contractor's License No. 6 Date 5-16, 19 80

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

Groundwater Application Review Summary Form

Application # ~~G~~- LL-1799

GW Reviewer Ben Scandella, Jen Woody **Date Review Completed:** 11/20/2019

Summary of GW Availability and Injury Review:

[ ] Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

[X] There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

[ ] The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

JI 11/20/19

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 11/20/2019

FROM: Groundwater Section Benjamin Scandella, Jen Woody
Reviewer's Name

SUBJECT: Application LL-1799 Supersedes review of
Date of Review(s)

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

OAR 690-310-130 (1) *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525.* Department staff review groundwater applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation**.

A. GENERAL INFORMATION: Applicant's Name: **CHRIS RAMSEY; DOMAINE SERENE VINEYARDS AND WINERY INC.**
County: **POLK**

A1. Applicant(s) seek(s) 0.045 cfs (20 gpm) from 1 well(s) in the Willamette Basin,
Middle Willamette subbasin

A2. Proposed use Irrigation Seasonality: March 1st through October 31st

A3. Well and aquifer data (**attach and number logs for existing wells; mark proposed wells as such under logid**):

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	**POLK 1036**	**1**	**CRB**	**0.045**	**6S/3W-18 NW-NW**	**795' S, 895' E fr NW cor S 18**

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	**520**	**290**	**223**	**5/12/1980**	**320**	**0-39**	**+1-39**	**10-320**	**280-310**	**20**	**97**	**Air (2-hr)**

Use data from application for proposed wells.

A4. **Comments:** The application states 2 different total annual volumes: 11.15 AF on p. 1, and 22 AF on the Land Use Information Form. For the purposes of this review, and annual volume of 11.15 AF is assumed.

A5. ☒ **Provisions of the** Willamette Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water ☐ **are**, *or* ☒ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: **690-502-0240** classifies use from unconfined alluvial aquifers. This application proposes use from a confined aquifer in the CRBG, so this rule is not activated.

A6. ☒ **Well #** **POLK 1036** tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: **Eola Hills Ground Water Limited Area (690-502-0200)**
Comments: "Groundwater in the basalt aquifers in the Eola Hills Groundwater Limited Area is classified for exempt uses, irrigation and rural residential fire protection systems only. Permits may be issued, for a period not to exceed five years, for fire protection and for drip or equally efficient irrigation provided the Director finds the proposed use and amount do not pose a threat to the groundwater resource or existing permit holders" (OAR 690-502-0200).

This proposed limited license application appears to be consistent with the provisions of OAR 690-502-0200.

B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that groundwater* for the proposed use:

a. ☐ **is** over appropriated, ☐ **is not** over appropriated, *or* ☒ **cannot be determined to be** over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;

b. ☐ **will not** *or* ☐ **will** likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;

c. ☐ **will not** *or* ☐ **will** likely to be available within the capacity of the groundwater resource; or

d. ☒ **will, if properly conditioned**, avoid injury to existing groundwater rights or to the groundwater resource:
   i. ☒ The permit should contain condition #(s) **7i (Willamette CRBG conditions); large water-use reporting**;
   ii. ☒ The permit should be conditioned as indicated in item 2 below.
   iii. ☒ The permit should contain special condition(s) as indicated in item 3 below;

B2. a. ☐ **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;

c. ☒ **Condition** to allow groundwater production only from a single aquifer in the Columbia River Basalt Group groundwater reservoir ~~between approximately ___ ft. and _____ ft. below land surface;~~

d. ☐ **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): ___

B3. **Groundwater availability remarks:**

The proposed POA, POLK 1036, is located in the southeastern foothills of the Eola Hills, which are comprised of Columbia River Basalt Group (CRBG) flows overlying older marine sedimentary rocks. Groundwater data for the CRBG aquifers in this area is sparse, with wells completed in the CRBG showing low to moderate yields from ~5-50 gpm. The long-term datasets for wells accessing CRBG aquifers in the vicinity show relatively stable levels. However, the elevation separation between the water levels in those wells vs. POLK 1036 makes it difficult to establish whether they access the same CRBG aquifer and conclude whether groundwater will be available within the capacity of the resource.

The nearest well to the subject well, POLK 994, is about ¼ mile away. However, the total depth of this well is almost 300 ft deeper than the water level recorded on the well log, so it is unlikely that this well would be injured by the proposed use.

There are multiple springs with associated rights (Certificate Numbers 30528 and 31628) located approximately ¼ mile from the subject well. Analytic modeling using the Theis (1941) drawdown model with relevant parameters (Conlon and others, 2005, OWRD Groundwater Database, 2019) suggests that pumping at the proposed rate for 125 days could plausibly cause up to 80 feet of drawdown at the spring on Certificate 31628 (see figure below). The large range of plausible outcomes makes it difficult to determine whether the proposed use is likely to interfere with the spring and cause a senior user not to receive their entitled water. However, given the strong potential for injury to the certificated springs under the proposed rate, and the unknown sensitivity of the spring to drawdown, the Limited License should be conditioned as follows:

Special Condition: POLK 1036 shall be shut off if either Certificate 30528 or Certificate 31628 does not receive the water to which it is legally entitled. The well shall remain shut off until the following spring, unless it is specifically re-authorized by The Director.

The conditions noted in B1(d) are required by the Willamette Basin rules for CRBG wells and will enable monitoring for use above the capacity of the resource.

C. GROUNDWATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Columbia River Basalt Group**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Water-bearing zones within the CRBG typically display high degrees of confinement. The well log for POLK 1036 shows the water level 67' above the top of the water-bearing zone, indicating confined conditions.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**King Creek**	**290-300**	**160-630**	**450**	☒	☐	☐	☐	☒
1	**2**	**Spring Valley Creek**	**290-300**	**133-136**	**4100**	☐	☒	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: SW elevation ranges encompass elevations within 1 mile of the well. King Creek incises through the CRBG in the vicinity of the well, and the coincidence of head values with SW elevations supports a finding of hydraulic connection.

Water Availability Basin the well(s) are located within: WID 182: WILLAMETTE R > COLUMBIA R - AB MOLALLA R

C3a. **690-09-040 (4):** Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked ☒ box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	**1**	☒	☐			☐	**3830**	☐	*	☒

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells**. Otherwise same evaluation and limitations apply as in C3a above.

	SW #		Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐

Comments: C3a note: *There is no appropriate model to estimate streamflow depletion from pumping in CRBG interflow zones that are incised by streams or discharge to point sources such as springs. Therefore, the percentage of interference at 30 days was not calculated. King Creek within ¼ mile of the POLK 1036 and is hydraulically connected to it, so PSI was assumed.

C3b: not applicable.

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.													
(B) = 80 % Nat. Q													
(C) = 1 % Nat. Q													
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation: N/A

C4b. **690-09-040 (5) (b) The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.**

C5. ☐ **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or groundwater use under this permit can be regulated if it is found to substantially interfere with surface water:

i. ☐ The permit should contain condition #(s)_____;

ii. ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:** N/A

References Used:

Application LL-1799 file

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 p.

Oregon Water Resources Department Groundwater Database.

U.S. Geological Survey. National Hydrography Dataset. Reston, VA: U.S. Dept. of the Interior, U.S. Geological Survey, 2018.

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82 p.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** _____ **Logid:** _____

D2. **THE WELL does not appear to meet current well construction standards based upon:**

a. ☐ review of the well log;
b. ☐ field inspection by _____;
c. ☐ report of CWRE _____;
d. ☐ other: (specify) _____

D3. **THE WELL construction deficiency or other comment is described as follows:** _____

D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

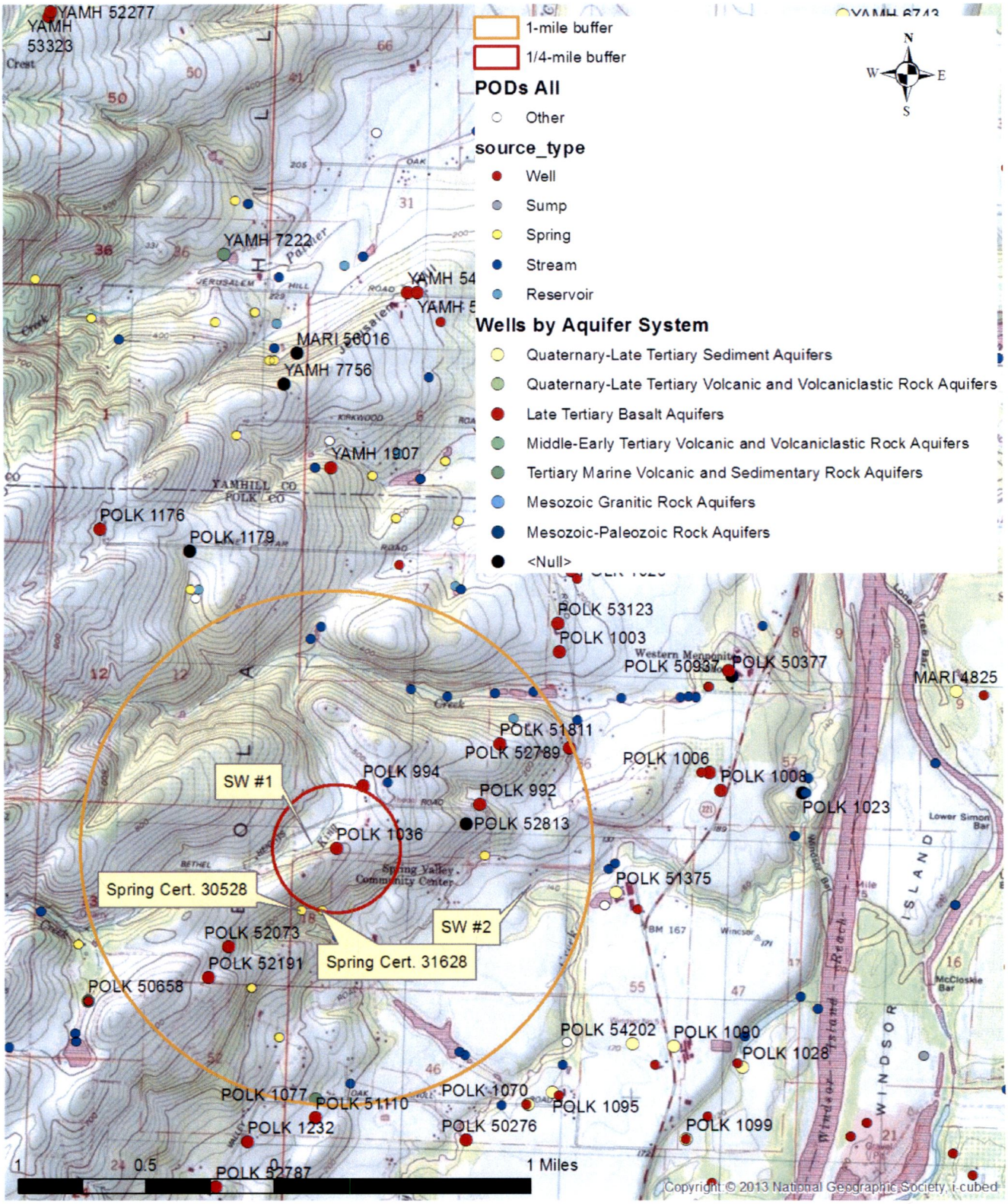
WILLAMETTE R > COLUMBIA R - AB MOLALLA R

Watershed ID #: 182 Basin: WILLAMETTE Exceedance Level: 80
Time: 11:51 AM Date: 04/12/2019

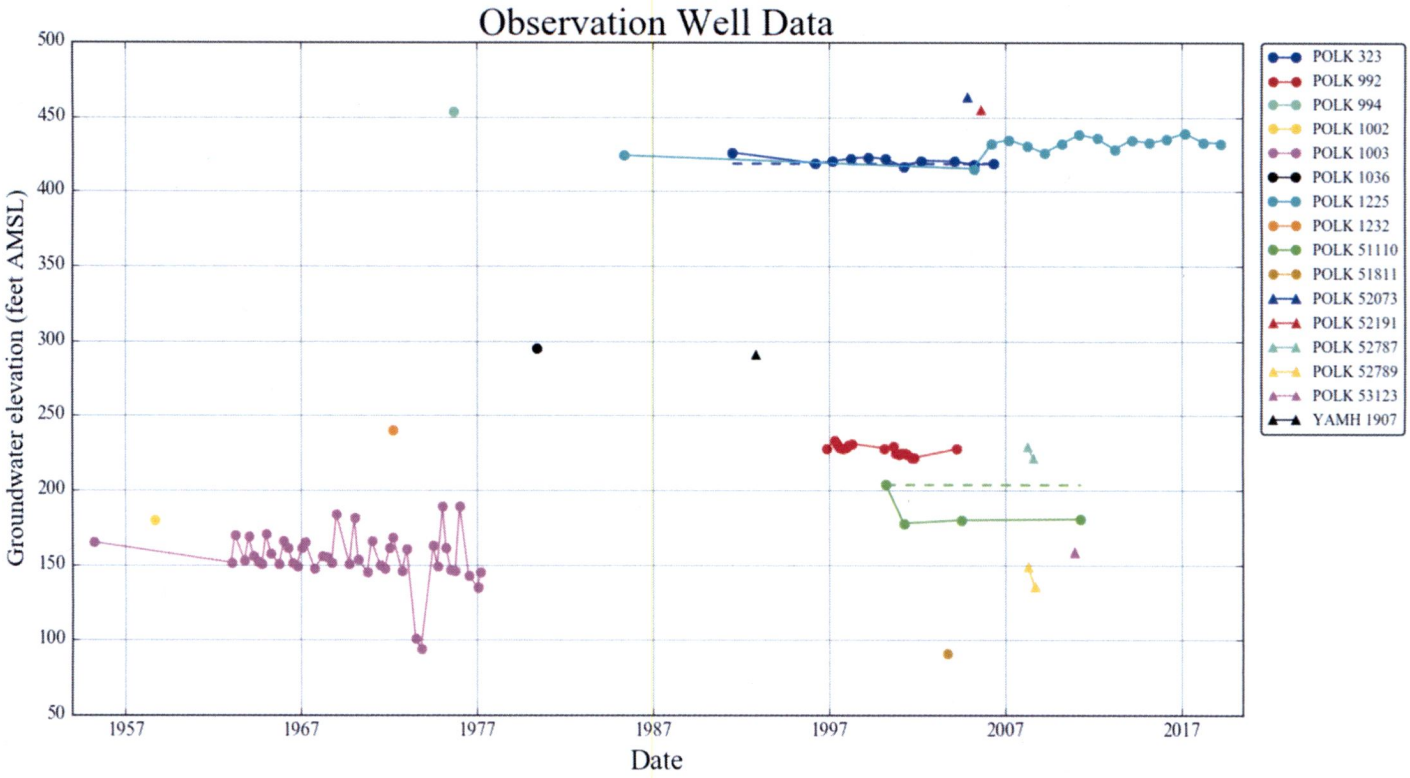
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
	Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.					
JAN	21,400.00	2,290.00	19,100.00	0.00	1,500.00	17,600.00
FEB	23,200.00	7,470.00	15,700.00	0.00	1,500.00	14,200.00
MAR	22,400.00	7,250.00	15,200.00	0.00	1,500.00	13,700.00
APR	19,900.00	6,900.00	13,000.00	0.00	1,500.00	11,500.00
MAY	16,600.00	4,240.00	12,400.00	0.00	1,500.00	10,900.00
JUN	8,740.00	1,980.00	6,760.00	0.00	1,500.00	5,260.00
JUL	4,980.00	1,810.00	3,170.00	0.00	1,500.00	1,670.00
AUG	3,830.00	1,650.00	2,180.00	0.00	1,500.00	681.00
SEP	3,890.00	1,390.00	2,500.00	0.00	1,500.00	996.00
OCT	4,850.00	747.00	4,100.00	0.00	1,500.00	2,600.00
NOV	10,200.00	879.00	9,320.00	0.00	1,500.00	7,820.00
DEC	19,300.00	961.00	18,300.00	0.00	1,500.00	16,800.00
ANN	15,200,000	2,250,000	13,000,000	0	1,090,000	11,900,000

Well Location Map

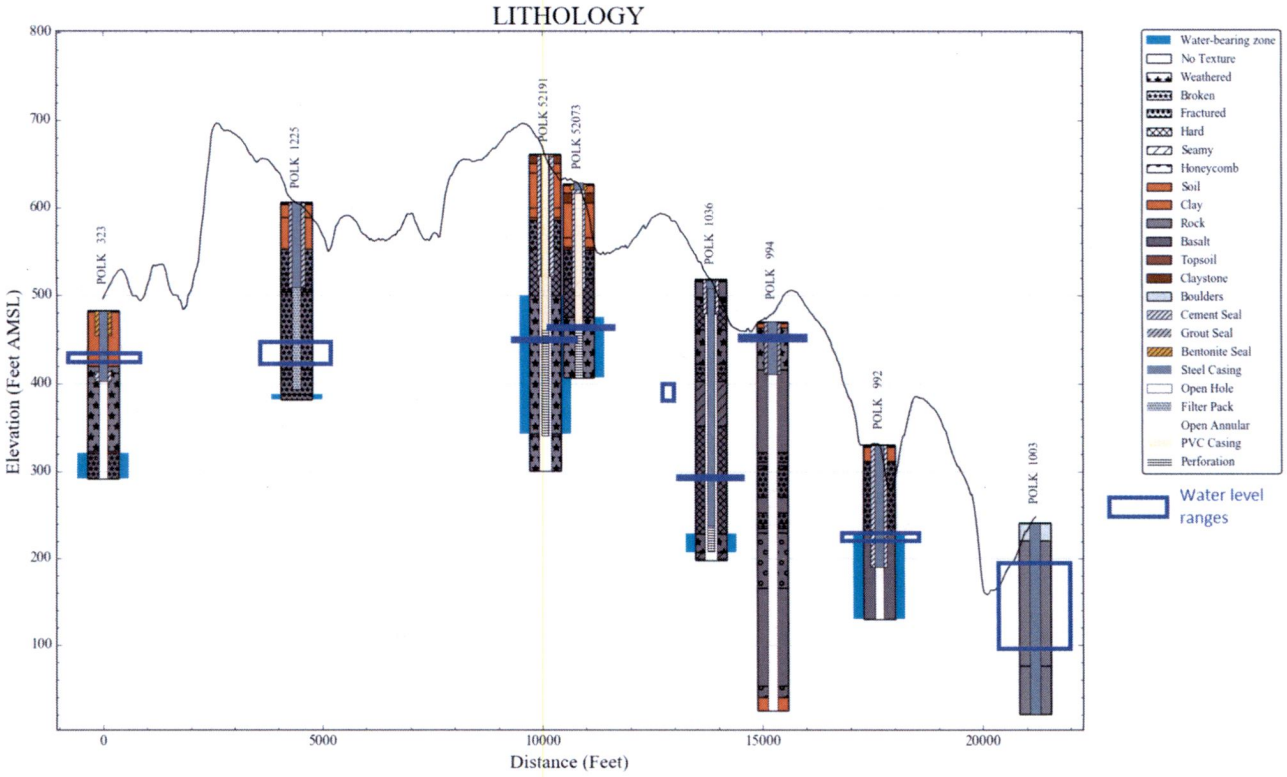
LL-1799 (Domaine Serene Vineyards and Winery, Inc.): 6S/3W-18



Water Levels in Nearby Wells Accessing Columbia River Basalt Aquifers



Cross-section of nearby well logs, with water-bearing zones and approximate ranges of measured water levels.



Model parameters and results

Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units	
Total pumping time	t		125		d	
Radial distance from pumped well:	r		1320.00		ft	Q conversions
Pumping rate	Q		20.0		gpm	20.00 gpm
Hydraulic conductivity	K	1	10	100	ft/day	0.04 cfs
Aquifer thickness	b		22		ft	2.67 cfm
Storativity	S_1		0.00010			3,850.27 cfd
	S_2		0.00001			0.09 af/d
Transmissivity Conversions	T_f2pd	22	220	2,200	ft2/day	
	T_ft2pm	0.0153	0.1528	1.5278	ft2/min	
	T_gpdpft	165	1,646	16,456	gpd/ft