Groundwater Application Review Summary Form

Application # LL- _1995_

GW Reviewer _Stacey Garrison_ Date Review Completed: _10/29/2024_

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:

☒ 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.

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).

WATER RESOURCES DEPARTMENT

MEMO **_October 29 2024_**

TO: **Application** LL-**_1995_**

FROM: **GW:** **_Stacey Garrison_**
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ **YES**
☒ **NO** The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries

☐ **YES**
☒ **NO** Use the Scenic Waterway Condition (Condition 7J)

☐ Per ORS 390.835, the Groundwater Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below

☐ Per ORS 390.835, the Groundwater Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is *unable to make a Preponderance of Evidence finding.*

Exercise of this permit is calculated to reduce monthly flows in _[Enter]_ Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 10/29/2024
FROM: Groundwater Section Stacey Garrison
Reviewer's Name
SUBJECT: Application LL- **1995** 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: **Domaine Serene Vineyard & Winery, Inc.** County: **Polk**

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

A2. Proposed use irrigation Seasonality: March 1 – October 31

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

POA 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 54400	1	CRB	0.045	6S/3W-18 NW-NW	715' S, 915' E fr NW cor S 18[a]

* Alluvium, CRB, Bedrock

POA Well	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Drawdown (ft)	Test Type
1	322	0 to 222	+2 to 222	22 to 282	282 to 322	21.5		Air

POA Well	Land Surface Elevation at Well (ft amsl)	Depth of First Water (ft bls)	SWL (ft bls)	SWL Date	Reference Level (ft bls)	Reference Level Date
1	511	229.1	229.1	3/15/2023	229.1	3/15/2023[b]

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU are approximately 5 miles northwest of Salem, Oregon.
[a] There is a discrepancy between the mapped location of the POA as indicated on the applicant's map and the metes-and-bounds description using the Department's PLSS projection. The mapped location is 140 ft southwest of the GPS location on the well log for POLK 54400, the metes-and-bounds location is 103 ft southeast of the GPS location. The GPS location on the well log is coincident with the location description based on POLK 1036. The GPS location from the well log for POLK 54400 is used.
[b] Reference level is from the POA (MARI 54400) reporting under LL-1799.

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: The proposed aquifer is confined. Per OAR 690-502-0240, the relevant basin rules do not apply.

A6. ☒ **Well(s) # 1** 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) **7IRLA (Willamette CRBG with RL set); 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. **Special Conditions:**

1. Each basalt well shall be cased and continuously sealed from land surface to a depth of at least 50 feet to preclude hydraulic connection to nearby streams.

2. Any well authorized as a Point of Appropriation (POA) under this or subsequent permits shall be open to a single aquifer of the Columbia River Basalt Group and shall meet the applicable well construction standards (OAR 690-200 and OAR 690-210). In addition, the open interval in each well shall be no greater than 100 feet. An open interval of greater than 100 feet may be allowed if substantial evidence of a single aquifer completion can be demonstrated to the satisfaction of the Department Hydrogeologists, using information from a video log, downhole flowmeter, water chemistry and temperature, or other downhole geophysical methods. These methods shall characterize the nature of the basalt rock and assess whether water is moving in the borehole. Any discernable movement of water within the well bore when the well is not being pumped shall be assumed as evidence of the presence of multiple aquifers in the open interval. Single aquifer completion for any well with an open interval greater than 100 ft should be demonstrated to the satisfaction of the Department Hydrogeologists prior to authorization as a POA under this or subsequent permits.

   If, during well construction or repair, it becomes apparent that the well can be constructed to eliminate aquifer commingling or interference with hydraulically connected streams in a manner other than specified in this permit, the permittee can contact the Department Hydrogeologist for this permit or the Ground Water/Hydrology Section Manager to request approval of such construction. The request shall be in writing and shall include a rough well log and a proposed construction design for approval by the Department. The request can be approved only if it is received and reviewed prior to placement of any new permanent casing and sealing material. If the request is made after casing and seal are placed, the requested modification will not be approved. If approved, the new well depth and construction specifications will be incorporated into any certificate issued for this permit.

3. For any well constructed under this or subsequent permits, a dedicated water-level measuring tube shall be installed in each well. The measuring tube shall meet the standards described in OAR 690-215-0060. When requested, access to the wells shall be provided to Department staff in order to make water-level measurements.

4. For any wells constructed or deepened under this or subsequent permits, the applicant shall coordinate with the driller to ensure that drill cuttings are collected at 10 ft intervals and at changes in formation in each well. A split of each sampled interval shall be provided to the Department.

5. If any geologic and hydrogeologic reports are completed for the permittee during the development of permitted wells, including geophysical well logs and borehole video logs, then copies of the reports shall be provided to the Department. Except for borehole video logs, two paper copies or a single electronic copy shall be provided of each report. Digital tables of any data shall be provided upon request.

6. Water user shall submit to the Water Resources Department the results of a pump test meeting the Department's standards for each well authorized, unless an exemption has been obtained in writing under OAR 690-217.

Groundwater availability remarks:
The POA/POU are located on the Columbia River Basalt Group (CRBG) on the eastern edge of the Eola Hills. The CRBG and underlying older rock are eastward-dipping, resulting in the cuesta shape of the Eola-Amity Hills (Price, 1967). The POA (POLK 54400) utilizes water-bearing zones (WBZs) within the CRBG. Aquifers in the CRBG are typically thin interflow zones between lava flows and confined by thicker flow interiors that have low porosity and low permeability (Conlon et al 2005, Gannett & Caldwell, 1998; Reidel et al., 2002). The POA is in an area deformed by faults, possibly resulting in compartmentalization of aquifers (Brownfield and Schlicker 1981). The POA (POLK 54400) is flanked by a pair of northeast trending faults, approximately 0.6 miles to the north and south (Brownfield and Schlicker, 1981). The degree of compartmentalization due to nearby faults, which is unknown at this time, may exacerbate well-to-well interference and longer-term water level declines in the local basalt aquifer (Conlon et al., 2005). CRBG wells in the Eola Hills are expected to experience annual declines of 5 to 15 ft at lower elevations, up to 30 ft at higher elevations, and wells that tap thin and/or perched aquifers may go dry in the summer (Price 1967). The CRBG pinches out at numerous locations in this area, indicating potential locations for springs fed by perched aquifers (Woodward et al., 1998; Conlon et al., 2005; Gannett and Caldwell, 1998; Price, 1967).
The proposed rate is 0.045 cfs (20 gpm). Most CRBG wells in the Eola-Amity Hills area produce less than 15 gpm, but some can yield more than 100 gpm (Price, 1967). The well log for the POA (POLK 54400) reports 21.5 gpm, but this was measured with an air test which can be less accurate than a pump test and there is no drawdown reported. A query of wells in the area (see Well Statistics) shows a max of 690 gpm and median of 30 gpm; the proposed rate is 3% of the maximum and 67% of the median. Within a mile of the POA, well logs in CRBG wells report yields ranging from 7 to 60 gpm, an average of 29.2, and median of 70.75; many of these are air tests. The POA appears capable of supplying the proposed rate.
Water level trends for nearby (0 to 3 miles from POA) wells that utilize the CRBG are stable (see Water Levels Measurements in Nearby Wells). Although there have been notable declines in the past, the more recent data does not indicate these declines have continued. Within one mile of the POA, there are 6 PODs for 8 spring-sourced water rights and no groundwater rights. The relatively stable water level conditions and lack of groundwater use in the area suggests a low likelihood of over-appropriation. The groundwater resource is likely not over-appropriated.
The nearest CRB groundwater user to the POA is likely the domestic well serving tax lot 701 at 3950 Bethel Heights Rd, located ~900 ft southwest of the POA, at an elevation of ~585 ft amsl. It is likely the proposed use would cause some degree of well-to-well interference with the well serving tax lot 701. To assess the degree of drawdown, a Theis drawdown analysis was conducted for the proposed use (see attached Theis Drawdown Analysis-TL 701). Results indicate that the proposed **use is not likely to cause well-to-well interference** with TL 701 that exceeds the threshold under the standard condition for basalt aquifers in the Willamette Basin.

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: Water use under this limited license shall be shut off if either Certificate 30528 or Certificate 31628 does not receive the water to which it is legally entitled. Water use 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 the POA (POLK 54400) shows the water level above the top of the WBZ, 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[a]	SW Elev ft msl[b]	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**King Creek**	**226.6-284.4**	**160-630**	**400**	☒	☐	☐	☐	☒
1	**2**	**Spring Valley Creek**	**226.6-284.**	**125-175**	**4,100**	☐	☒	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: SW elevation ranges encompass elevations within 1 mile of the well. SW 1 (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. There are CRBG wells in the area that likely have hydraulic connection with SW 2 (Spring Valley Creek), with SWLs ranging from 91 to 478 ft amsl[c], however, the POA (MARI 54400) does not appear to have hydraulic connection with SW 2 (Spring Valley Creek).

[a] Groundwater elevation range for POA (MARI 54400) calculated from SWL reported in well log and permit water level reporting.

[b] Surface water elevations were estimated from land surface elevations along stream reaches (Watershed Sciences, 2009; USGS, 2013).

[c] Groundwater elevation calculated from static water level and WBZs reported in well logs and/or latest static water level reported for POLK 992, POLK 994, POLK 52073, POLK 51811, POLK 52813, POLK 52789, POLK 52191, POLK 1036, POLK 54400, POLK 50620, POLK 54779, POLK 53694.

Water Availability Basin the well(s) are located within: 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 (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, 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**	☒	☐			☐	**3,830**	☐	*	☒

Comments: **The POA (POLK 54400) has hydraulic connection to and is within a quarter mile of SW 1 (King Creek), therefore the POA has the Potential for Substantial Interference (PSI) with SW 1 per OAR 690-009-0040(4)(a).**

*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.

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: N/A- Q not distributed

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-streams within 1 mile evaluated above.

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:** **The POA (POLK 54400) has hydraulic connection to and is within a quarter mile of SW 1 (King Creek), therefore the POA has the Potential for Substantial Interference (PSI) with SW 1 per OAR 690-009-0040(4)(a).**

References Used:

Application File: LL-1995, LL-1799

Pumping Test Files: POLK 1225, YAMH 7749.

Well Reports: POLK 992, POLK 994, POLK 52073, POLK 51811, POLK 52813, POLK 52789, POLK 52191, POLK 1036, POLK 54400, POLK 50620, POLK 54779, POLK 53694.

Brownfield, M. and Schlicker, H.G. 1981. Preliminary geologic map of the Amity and Mission Bottom quadrangles, Oregon. Department of Geology and Mineral Industries.

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.

Herrera, N.B., Burns, E.R., and Conlon, T.D., 2014, Simulation of groundwater flow and the interaction of groundwater and surface water in the Willamette Basin and Central Willamette subbasin, Oregon: U.S. Geological Survey Scientific Investigations Report 2014-5136, 152 p.

Price, D. 1967. Ground Water in the Eola-Amity Hills Area Northern Willamette Valley, Oregon. USGS Water-Supply Paper 1847, 66 pages

Reidel, S.P., Johnson, V.G., and Spane, F.A., 2002, Natural gas storage in basalt aquifers of the Columbia Basin, Pacific Northwest USA—A guide to site characterization: Richland, Wash., Pacific Northwest National Laboratory, 277 p.

Theis, C.V., 1935, The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using ground-water storage: American Geophysical Union transactions, v. 16, p. 519-524.

United States Geological Survey, 2013, National Elevation Dataset (NED) [DEM geospatial data]. 1/9th arc-second, updated 2013.

United States Geological Survey, 2014 Mission Bottom quadrangle, Oregon [map], 1:24,000, 7.5 minute topographic series, U.S. Department of the Interior, Reston, Virginia.

Watershed Sciences, 2009, LIDAR remote sensing data collection, Department of Geology and Mineral Industries, Willamette Valley Phase I, Oregon, Portland, OR, December 21.

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

Oregon Water Resources Department
Water Availability Analysis

Main Help Return Contact Us

Water Availability Analysis
Detailed Reports

WILLAMETTE R > COLUMBIA R - AB MOLALLA R
WILLAMETTE BASIN
Water Availability as of 10/24/2024

Watershed ID #: 182 (Map)
Date: 10/24/2024

Exceedance Level: 80%
Time: 2:01 PM

Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations
Water Rights | Watershed Characteristics

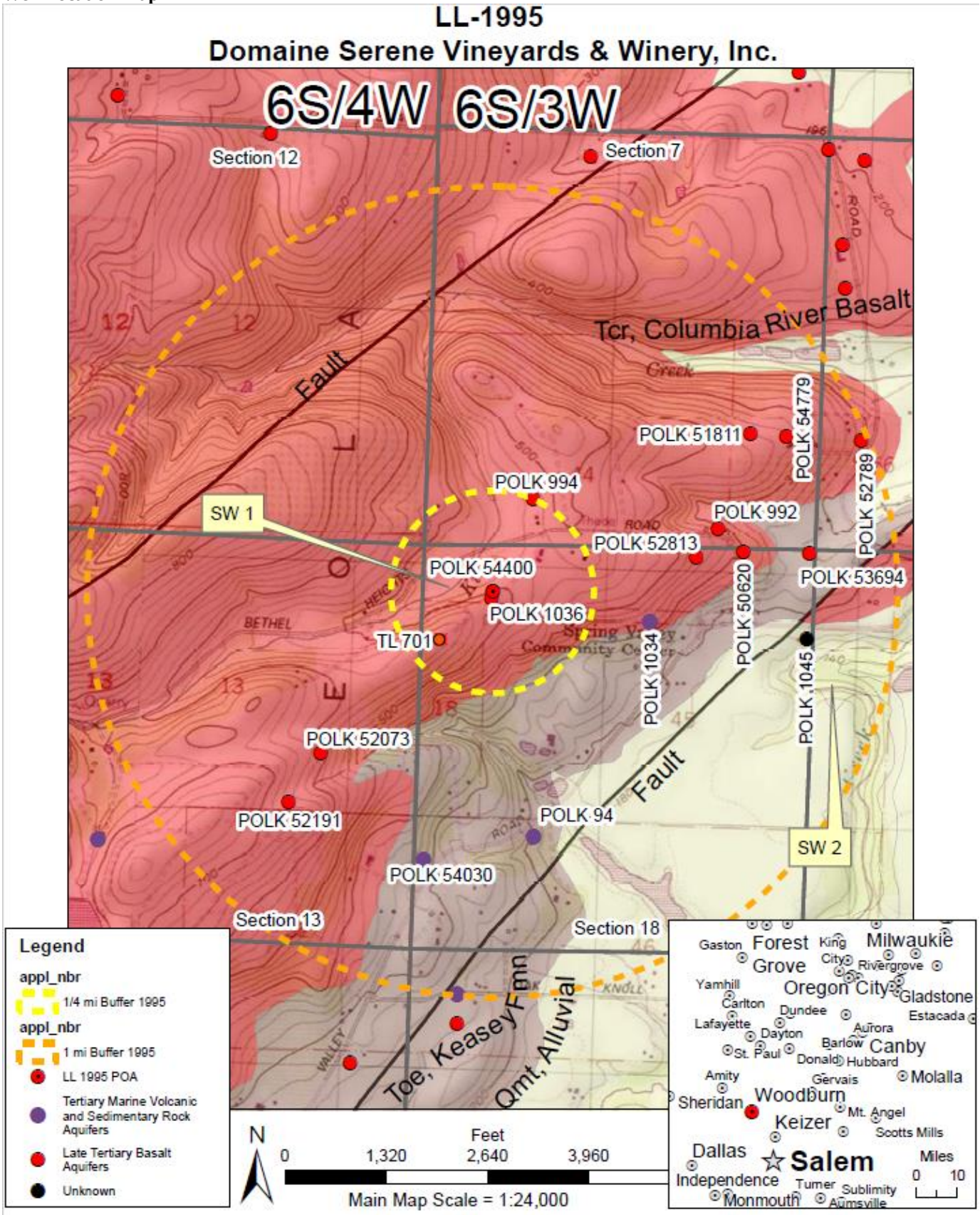
Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

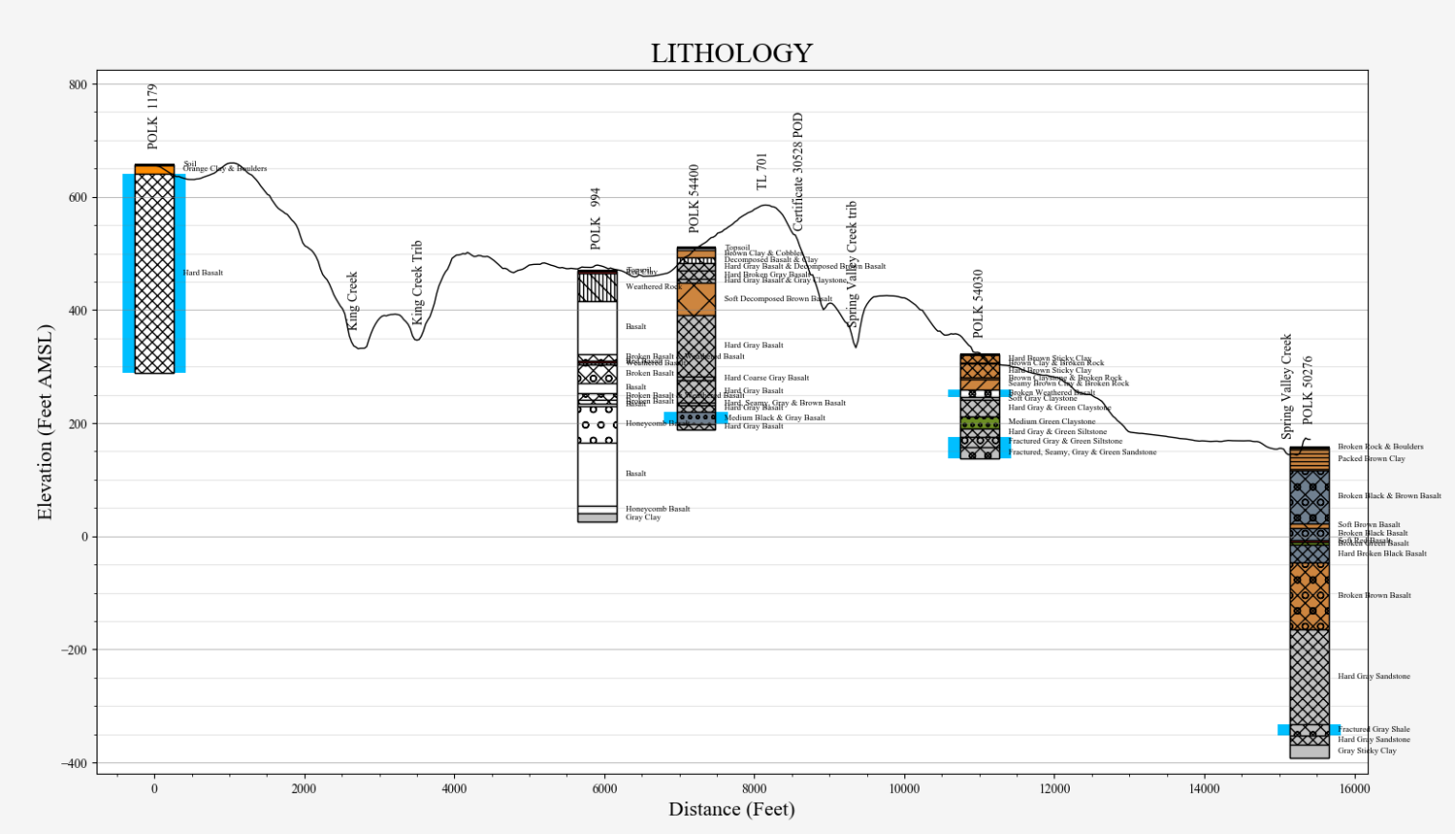
Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	21,400.00	2,300.00	19,100.00	0.00	1,500.00	17,600.00
FEB	23,200.00	7,490.00	15,700.00	0.00	1,500.00	14,200.00
MAR	22,400.00	7,260.00	15,100.00	0.00	1,500.00	13,600.00
APR	19,900.00	6,910.00	13,000.00	0.00	1,500.00	11,500.00
MAY	16,600.00	4,250.00	12,300.00	0.00	1,500.00	10,800.00
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	997.00
OCT	4,850.00	753.00	4,100.00	0.00	1,500.00	2,600.00
NOV	10,200.00	887.00	9,310.00	0.00	1,500.00	7,810.00
DEC	19,300.00	975.00	18,300.00	0.00	1,500.00	16,800.00
ANN	15,200,000.00	2,250,000.00	13,000,000.00	0.00	1,090,000.00	11,900,000.00

Download Data (Text - Formatted , Text - Tab Delimited , Excel)

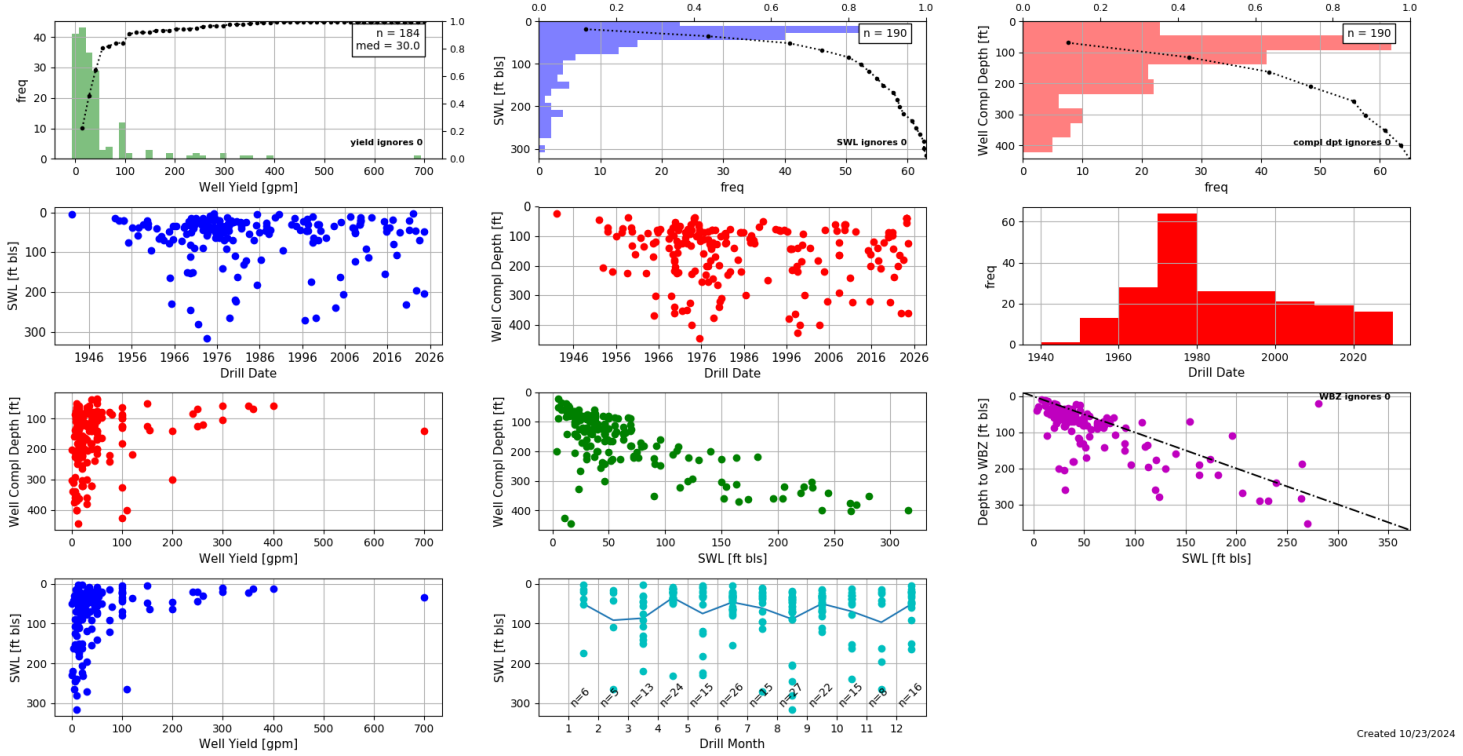
Well Location Map



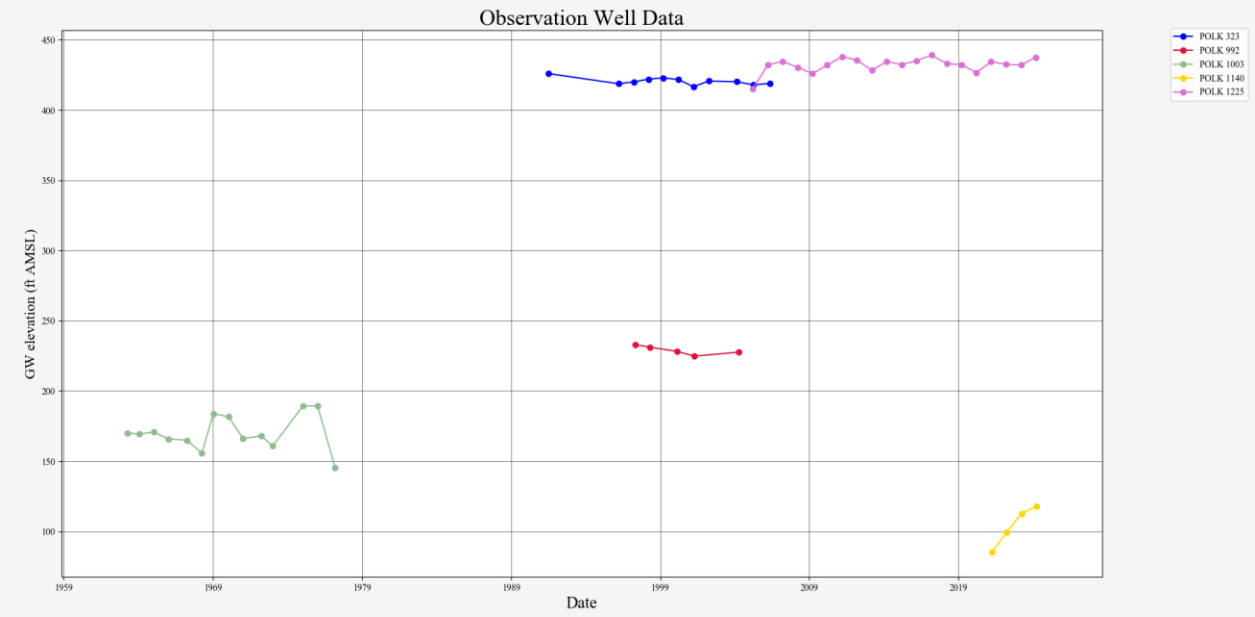
Cross-Section



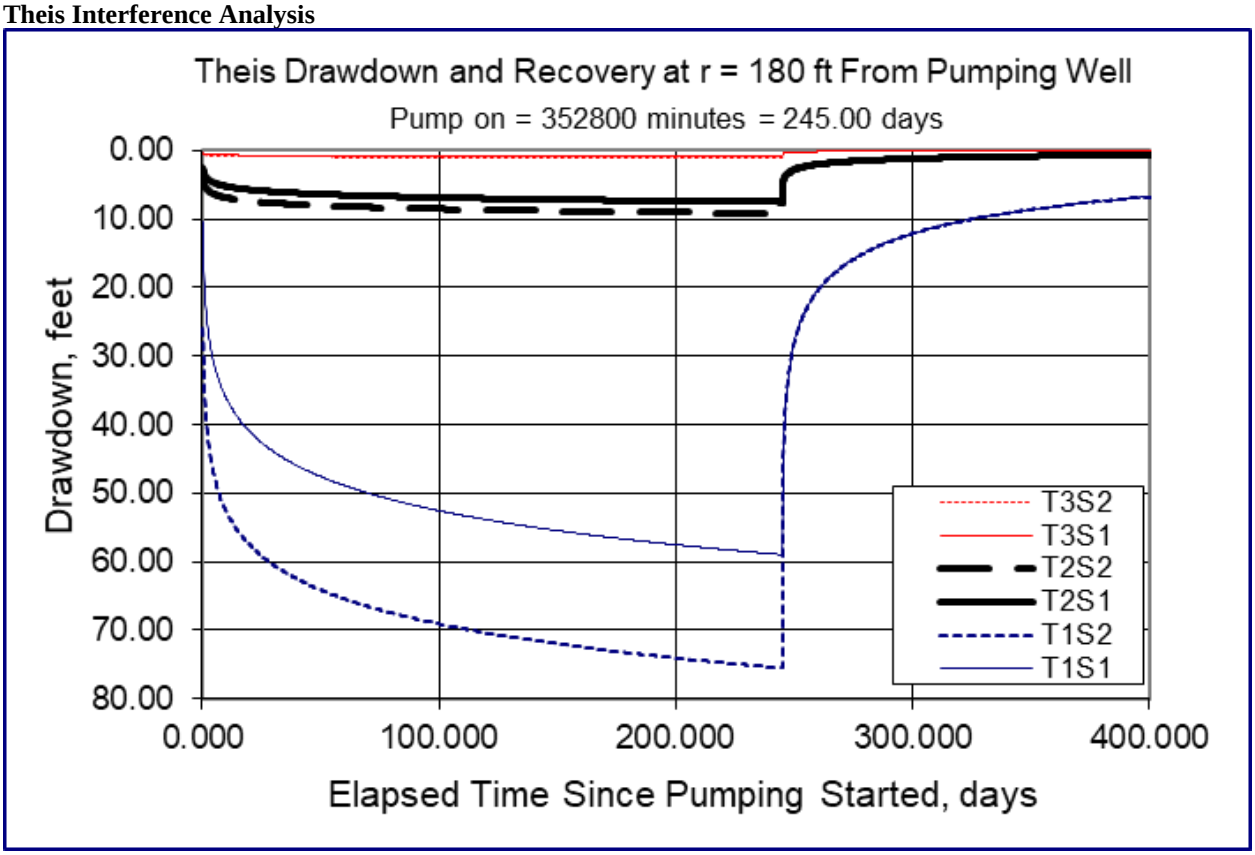
Well Statistics



Water-Level Measurements in Nearby Wells



Theis Interference Analysis



Radial distance from pumping well (r)=180 ft [estimated radial distance to nearest groundwater user, tax lot 701]
Pumping Rate (Q)= 0.023 cfs (~10.3 gpm)*
Aquifer Transmissivity (T1)= 165 gpd/ft (22 ft^2/day), (T2)= 1,646 gpd/ft (220 ft^2/day), (T3)= 16,456 gpd/ft (2,200 ft^2/day)
Storativity (s1) = 0.0001, (s2) = 0.00001 [Conlon et al 2005, Table 1 values for Central CRB]
Total pumping time=245
*The full pumping rate could not be utilized continuously for the entire 245-day period of use without exceeding the 11.15 ac-ft maximum allowed duty. For the maximum allowed duty of 11.15 ac-ft, continuous pumping would occur for 245 days at a rate of 0.023 cfs (~10.3 gpm).