

# Groundwater Application Review Summary Form

Application # G- 18829 (re-review)

GW Reviewer Travis Brown Date Re-Review Completed: 3/15/2021

## 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**

**March 15, 2021**

**TO:**            **Application G- 18829 (re-review)**

**FROM:**        **GW: Travis Brown**  
                    (Reviewer's Name)

**SUBJECT: Scenic Waterway Interference Evaluation**

**YES**            The source of appropriation is hydraulically connected to a State Scenic  
 **NO**             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 3/15/2021  
 FROM: Groundwater Section Travis Brown  
 Reviewer's Name  
 SUBJECT: Application G- 18829 Supersedes review of 7/31/2019  
 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: Paul and Donna Lipscomb County: Marion

A1. Applicant(s) seek(s) 0.17 0.11 cfs from 1 well(s) in the Willamette River Basin, \_\_\_\_\_ subbasin

A2. Proposed use Drip Irrigation (79.9 acres) Seasonality: March 1 – October 31 (2019-2025)

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	PROPOSED	1	CRB	0.17 0.11 <sup>a</sup>	8S/3W-21 NW-SW	2,450' N, 300' E fr SW cor S 21

\* 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	~710 <sup>b</sup>				c	c	c	c	c			

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is approximately 0.5 miles southwest of the city limits of Salem, Oregon. Applicant has requested a temporary irrigation use for establishment of a vineyard between 2019-2025.

<sup>a</sup> In Section 3 of Application, Applicant lists "Well Specific Rate (GPM)" as 60 gpm (~0.134 cfs). However, the total maximum rate requested is listed as 0.17 cfs (~76 gpm) and there is only one proposed POA. Therefore, the proposed POA will be evaluated at the total maximum rate of 0.17 cfs. In an email to Elisabeth Graham (OWRD Water Rights Division) dated March 24, 2020, the applicant reduced their requested rate to 50 gpm (~0.11 cfs).

<sup>b</sup> Proposed well elevation based on LIDAR ground surface elevation at proposed POA location (Watershed Sciences, 2009).

<sup>c</sup> Applicant has not provided well construction details for proposed POA.

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 POA is greater than 1/4-mile from the nearest surface water source and will develop a confined aquifer; therefore, per OAR 690-502-0240, the relevant Willamette Basin rules (OAR 690-502-0140) do not apply.

A6.  **Well(s) #** 1, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, tap(s) an aquifer limited by an administrative restriction.

Name of administrative area: South Salem Hills Groundwater Limited Area

Comments: Per OAR 690-502-0200(1), groundwater in the basalt aquifers of the South Salem Hills Groundwater Limited Area is classified for exempt uses, irrigation and rural residential fire protection systems only. Permits may be issued for drip irrigation for a period not to exceed five years (suggested expiration date October 31, 2024 2025 assuming use begins in the spring of 2020 2021) provided the proposed use and amount do not pose a threat to the groundwater resource or existing permit holders. The amount of water used for irrigation shall be limited to 1 af/acre per year, for a total of 79.9 af/year. However, at the revised requested rate (0.11 cfs) the applicant would only be able to achieve a maximum volume of 53.361 af within the irrigation season (March 1 – October 31).

**NOTE: Limited License (LL) 1597 was issued for the proposed POA and POU on January 7, 2016 and expires on May 15, 2021. If a permit is issued pursuant to this application, LL-1597 should be cancelled to prevent the user from exceeding the applicable duty (1 af/acre) for the South Salem Hills Groundwater Limited Area.**

**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 Basalt Condition), 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 175 ft. below land surface;
- c.  **Condition** to allow groundwater production only from the \_\_\_\_\_ 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: Groundwater for the proposed use cannot be determined to be over-appropriated due to insufficient available data regarding rates of recharge and the current quantity of groundwater withdrawals from the aquifer system.**

The Applicant has not included detailed well construction information for the proposed POA. Section 3 of the application does indicate the “Grand Rhonde [sic] Basalt Formation” as the intended source aquifer. However, multiple units of the Grande Ronde – including the Sentinel Bluffs, Winter Water, and Ortlely – have been identified in this area and multiple, hydrologically-distinct aquifers may exist as well. Geologic mapping in this area indicates that Columbia River Basalt Group (CRBG) flows may extend to ~360 ft below land surface (bls) (elevation ~350 ft above mean sea level [amsl]) (Tolan and Beeson, 2000). Nearby well logs (MARI 58051 and 66753) indicate that the Silver Falls and Sentinel Bluffs units are deeply weathered and yield minimal, if any, useable water. Near the interpreted contact between the Winter Water and Ortlely basalt unit (~190-215 ft bls) there does appear to be useable water, with ~45 gpm reported in MARI 58051 between ~207-280 ft bls and ~40 gpm reported in MARI 66753 between ~250-284 ft bls.

Constructing a well that is open to multiple water-bearing zones with distinct hydraulic heads can allow commingling of multiple aquifers. When the pump is off, water migrates through the well bore from an aquifer of higher pressure to an aquifer of lower pressure. Over time, this can depressurize the aquifer and exacerbate water level decline. Well construction conditions (see **Special Conditions**, below) are recommended to protect the resource and existing users.

The nearest groundwater user (MARI 58051, an exempt domestic well) is ~290 ft northwest of the proposed POA location. **The location of MARI 58051 was not available at the time of approval for LL-1597.** MARI 58051 is completed to a depth of ~283 ft bls and has open annular space from ~151-283 ft bls. Although well construction information was not specified for the proposed POA, it is likely the proposed use would cause some degree of well-to-well interference with MARI 58051. To assess the degree of **drawdown interference**, a Theis drawdown analysis was conducted for the proposed use (see attached Theis Drawdown Analysis). ~~Results indicate that the proposed use could cause well-to-well interference with MARI 58051 to exceed 15 ft of drawdown within approximately 2 weeks of continuous operation, which would require curtailment of the proposed use per Condition 7i, above. Therefore, it would appear that groundwater for the proposed use will not likely be available in the amounts requested without injury to prior water rights.~~ **Results indicate that, at the revised requested rate of 50 gpm**

**(~0.11 cfs), the proposed use is unlikely to cause interference sufficient to deprive MARI 58051 or similarly-located wells of groundwater to which they are legally entitled.**

Long-term water level data are primarily available for wells located near or on the far side of normal faults mapped by Tolan and Beeson (2000). These data indicate varied water level trends, though most wells show only moderate water level declines over time (see attached Hydrograph). However, statistical analysis of water wells completed in Sections 20 and 21 of Township 8 South, Range 3 West indicate a trend of deepening well completions over time, as well as a trend of lower static water levels (SWLs) with deeper well completions (see Well Statistics – 8S/3W S20 & S21, attached). There is also some indication of deeper initial reported SWLs over time. These trends may be a consequence of dropping water levels in the aquifer. There is some uncertainty that the groundwater resource can sustain the proposed use of ~~0.17 cfs (-76 gpm)~~ 0.11 cfs (50 gpm); median reported well yield in Sections 20 and 21 is 20 gpm (~0.04 cfs), ~26 percent of the requested use (see Well Statistics - 8S/3W S20 & S21, attached). However, the maximum reported yield in these sections is 300 gpm (0.67 cfs).

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. To protect existing users, the following **Special Conditions** are recommended for any permit issued pursuant to this application.

**Special Conditions:**

1. Best management practices shall be used to maximize the efficiency of water use. Drip irrigation or low-pressure sprinklers shall be used. Use shall be limited to one acre-foot per acre per year.
2. The well shall be continuously cased and continuously sealed to at least 175 feet below land surface, or as approved by a Department hydrogeologist during the drilling process.
3. The well shall be open to a single aquifer in the Winter Water Unit of the Grande Ronde Basalt Formation in the Columbia River Basalt Group and shall meet applicable well construction standards (OAR 690-200 and OAR 690-210). In addition, the open interval shall be no greater than 100 feet. However, a larger open interval may be approved by the Department if the applicant can demonstrate to the satisfaction of the Department that each well is only open to a single aquifer. Following well completion, the well shall be thoroughly developed to remove cuttings and drilling fluids. Substantial evidence of a single aquifer completion may be collected by video log, downhole flowmeter, water chemistry and temperature, or other downhole geophysical methods approved by the Department. 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.
4. A dedicated water-level measuring tube shall be installed in the production well. The measuring tube shall meet the standards described in OAR 690-215-0060. When requested, access to the well shall be provided to Department staff in order to make water-level measurements.
5. Drill cuttings shall be collected at 10-foot intervals and at changes in formation in the well and a split of each sampled interval shall be provided to the Department.
6. Copies of all geologic and hydrogeologic reports completed for the permittee during the development of the well, including geophysical well logs and borehole video logs, 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.
7. For any well drilled under a permit issued pursuant to this application, **a constant-rate aquifer test shall be conducted before beneficial use of the well begins** to determine aquifer properties and to assess the potential impacts from use of the well. The test shall be designed and conducted by an Oregon Registered Geologist and the test design shall be subject to the approval of the Groundwater Section of the Department prior to the test. At a minimum, the test shall include discharge and water-level measurements in the pumping well and simultaneous water-level measurements in all other wells drilled under this water right. **Simultaneous water-level measurements shall also be made in MARI 58051. The applicant will be responsible for obtaining permission from the owners of MARI 58051 to monitor the well throughout the aquifer test.** Additionally, water-level measurements shall be made at a minimum of one observation well that is constructed to a similar bottom elevation as the pumping well, and with a similar open interval. The observation well shall be at least 500 feet from the production well, and shall be constructed by the applicant and maintained as a dedicated observation well for the duration of groundwater use under this license. Pumping duration for the test shall be determined by the Groundwater Section of the Department after well yield and specific capacity are determined. The requirement for a constant-rate aquifer test on each well may be waived if a multiple-well aquifer test is performed involving all permitted wells on this water right within five years of the date of permit issuance. The results of each aquifer test shall be presented in a report to the Department that includes an analysis of aquifer properties, aquifer boundaries, and the potential impact on nearby wells that is likely to occur over the duration of an irrigation season if the well is used at the proposed rate and duty. The licensee shall allow Department staff access to install water-level monitoring equipment for the duration of this license.

**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	CRBG	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer confinement evaluation:** Nearby CRBG water well logs report SWLs above the water-bearing zone(s), indicating a confined aquifer or series of aquifers.

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?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Battle Creek	~550-570	~450-620	~2,110	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Basis for aquifer hydraulic connection evaluation:** Nearby CRBG wells (MARI 58051, 64177, 66753) completed into the Winter Water / Ortley interflow zone indicate water level elevations between ~550-570 ft amsl (with casing and seal from land surface to at least 560 ft amsl), which are within the range of surface water elevations estimated for Battle Creek within 1 mile of the proposed POA. Furthermore, Battle Creek appears to have incised below the uppermost elevation (~480-510 ft amsl) of the Winter Water / Ortley water-bearing zone noted in MARI 58051 and MARI 66753). Groundwater from the uplands likely discharges to surface water, providing baseflow or spring flow to sustain nearby perennial reaches of the creek. Therefore, there is hydraulic connection between the groundwater in the CRBG aquifers and nearby surface water.

**Water Availability Basin the well(s) are located within:** MILL CR > WILLAMETTE R – AT MOUTH

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	<input type="checkbox"/>	<input type="checkbox"/>	N/A	N/A	<input type="checkbox"/>	16.30	<input type="checkbox"/>	*	<input type="checkbox"/>

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?
	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

**Comments: C3a:** The proposed rate of appropriation (0.17 cfs) is greater than one percent (0.163 cfs) of the discharge that is equaled or exceeded 80 percent of the time (16.30 cfs) for SW 1 (Battle Creek). PSI is assumed on this basis. The requested rate (50 gpm or ~0.11 cfs) is less than one percent (0.163 cfs) of the discharge that is equaled or exceeded 80 percent of time (16.30 cfs) for SW 1 (Battle Creek). PSI is no longer assumed on this basis. (See attached Water Availability Table.)

\* There is no appropriate analytical 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 due to the proposed use has not been calculated.

**C3b:** N/A

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													
(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:** **Well construction Special Conditions are specified in Section B(3) to minimize potential impacts to surface water.**

**References Used:**

Application File: G-18829, LL-1597

Water Well Reports: MARI 58051, 64177, 66753

Pumping Test Reports: MARI 11654, 12357, 12788, 12958, 18891, 19217

Aquifer Test: MARI 65954

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*, Scientific Investigations Report 2005-5168: U. S. Geological Survey, Reston, VA.

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.

Tolan, T. L., and Beeson, M.H., 2000, Geologic map of Sidney quadrangle, 1:24,000, unpublished data.

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

United States Geological Survey, 2017, Sidney 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.**

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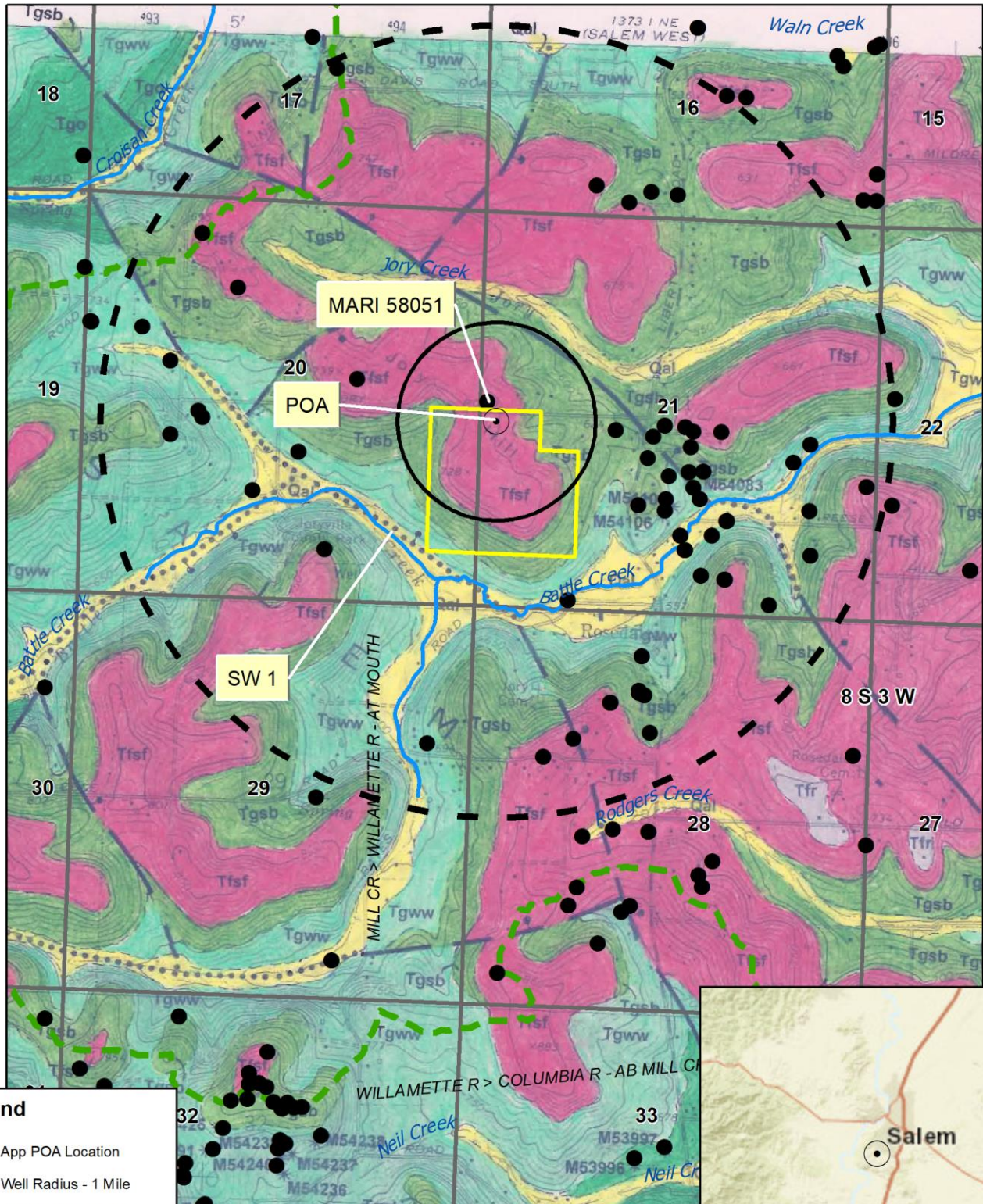


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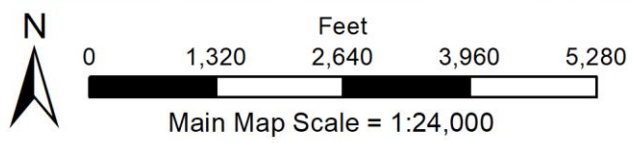
Well Location Map

# G-18829 Lipscomb



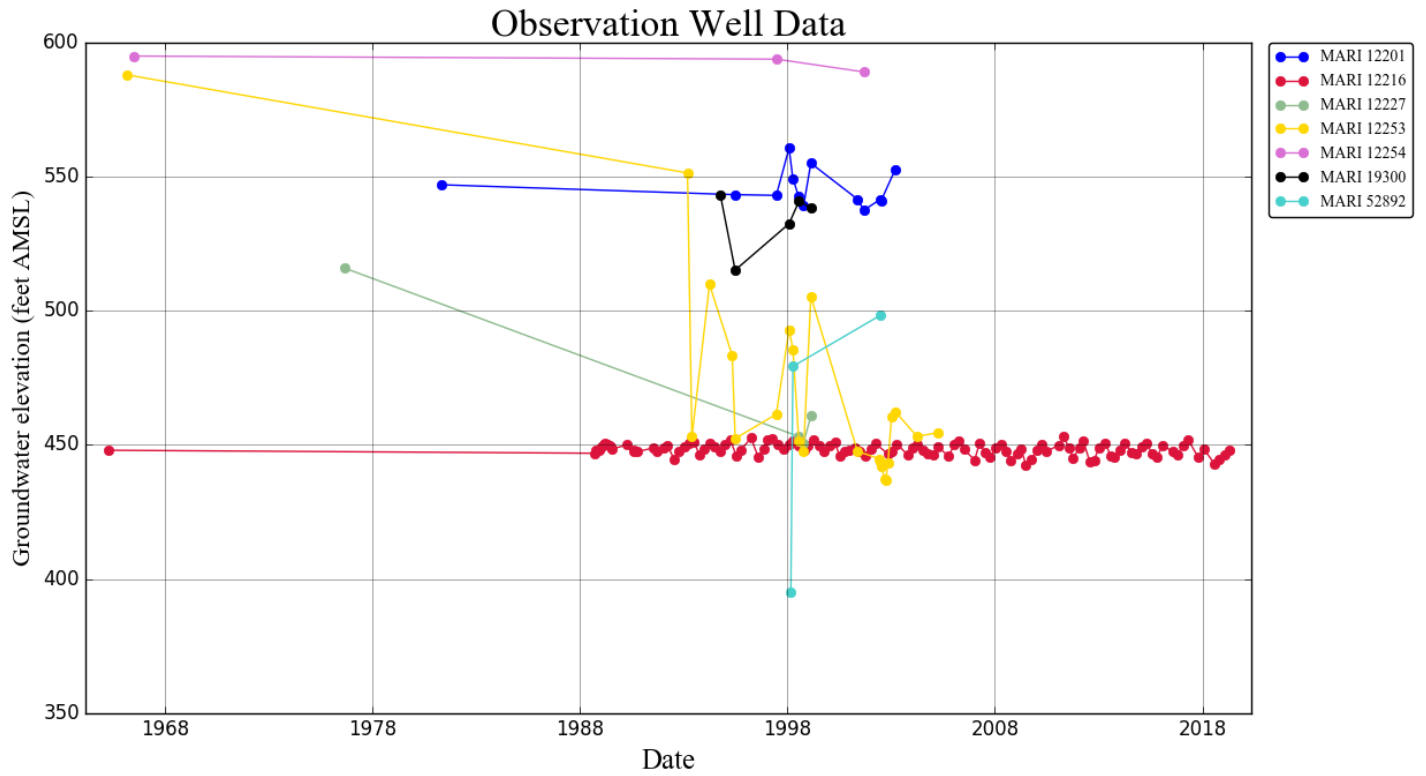
**Legend**

- App POA Location
- Well Radius - 1 Mile
- Well Radius - 1/4 Mile
- POA
- Water Availability Basins
- Well

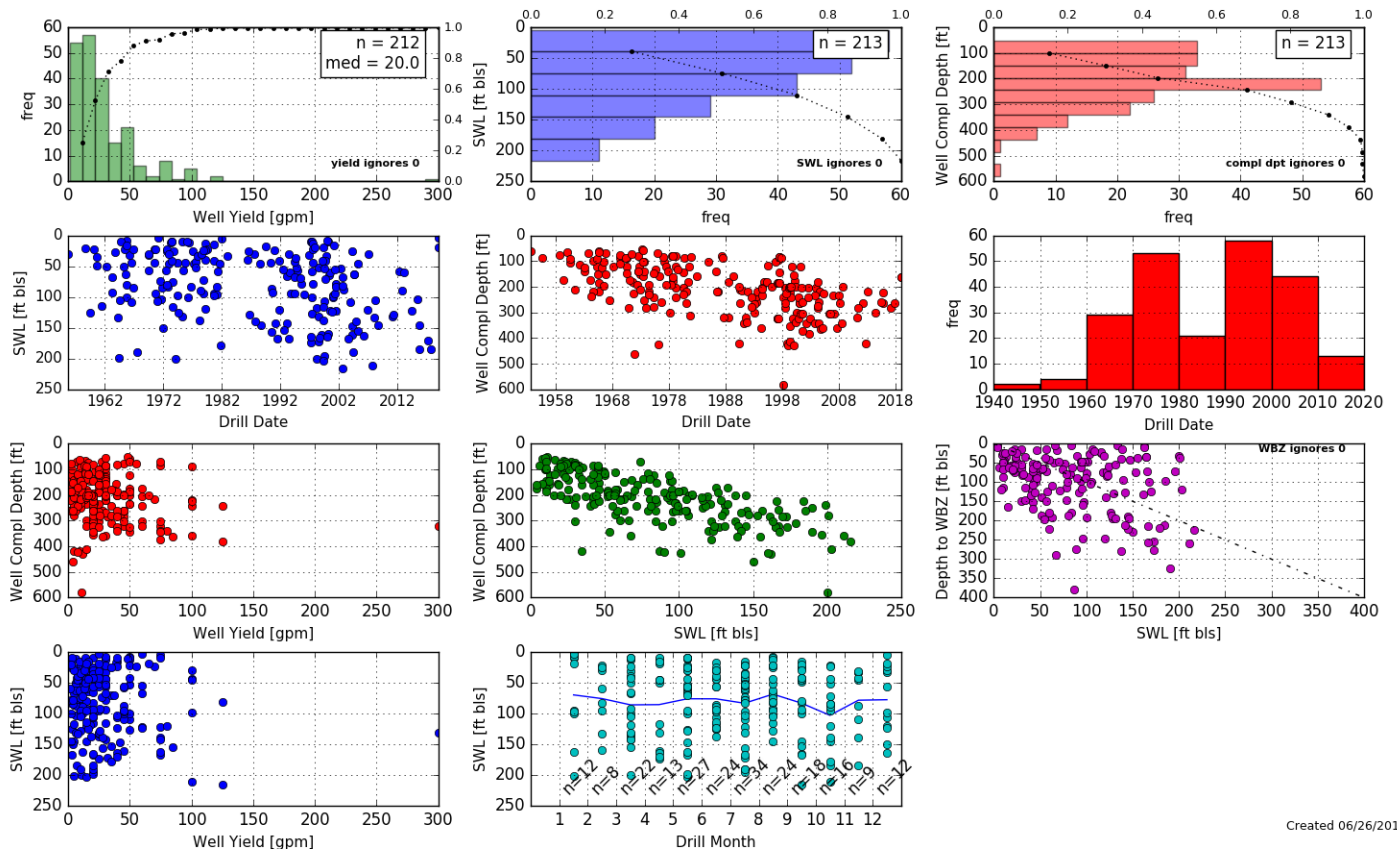


Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

### Hydrographs

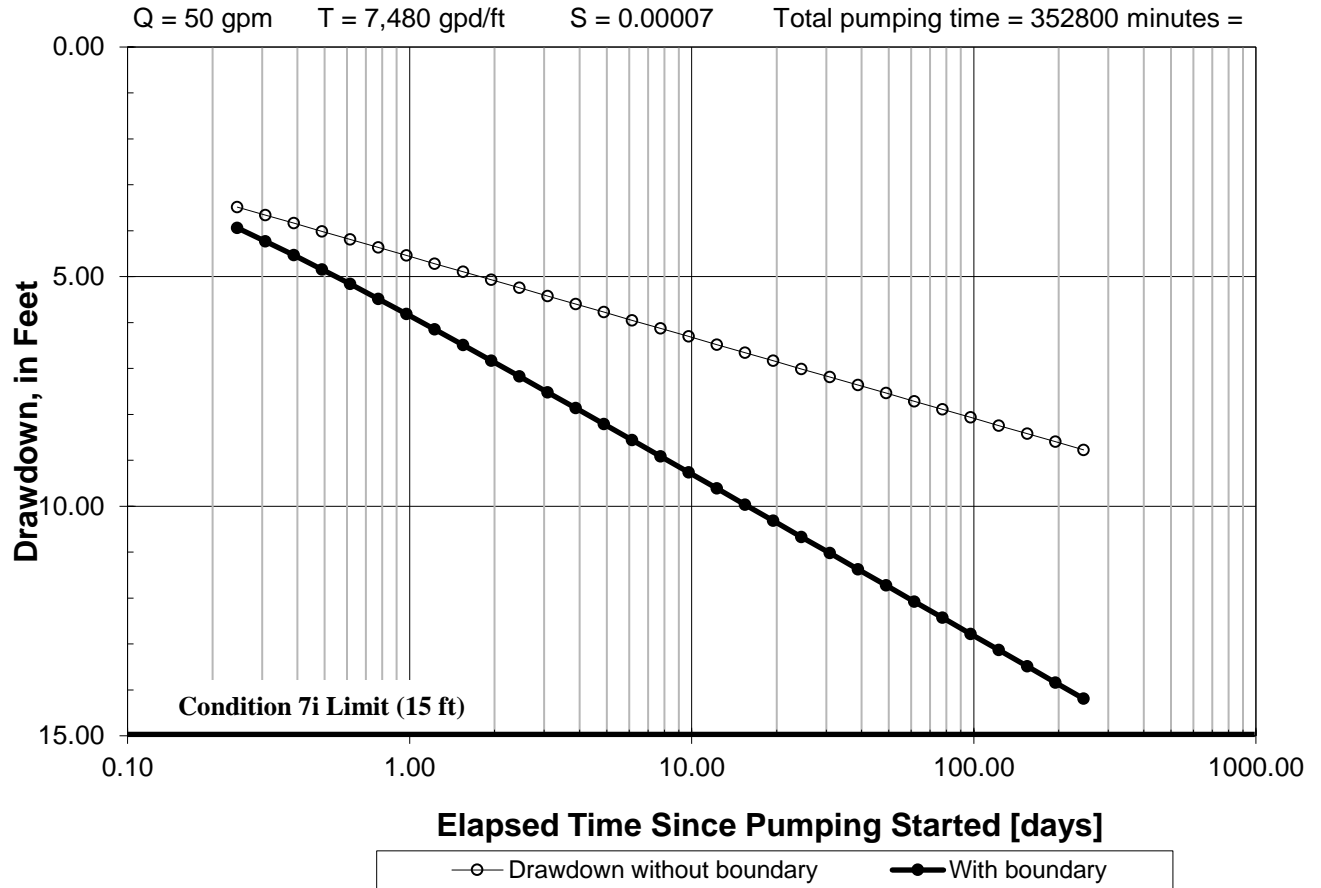


### Well Statistics



**Theis Drawdown Analysis**

**Theis Drawdown at r = 115,265 ft From Pumping Well**



**Radial Distance from Pumping Well (r) = 289 ft [radial distance to nearest user, MARI 58051]**

**X Distance (Perpendicular to Fault) = 115 ft**

**Y Distance (Parallel to Fault) = 265 ft**

**Distance to Barrier Boundary (fault) from Pumping Well (x) = 1,225 ft [Tolan and Beeson, 2000]**

**Pumping Rate (Q) = 50 gpm (0.11 cfs) [revised requested rate]**

**Aquifer Transmissivity (T) = 7,480 gpd/ft (1,000 ft<sup>2</sup>/day) [maximum transmissivity from nearby pumping tests]**

**Storativity (S) = 7x10<sup>-5</sup> [MARI 65954 aquifer test]**

**Total Pumping Time = 245 days [irrigation season]**

Water Availability Tables

# Water Availability Analysis

## Detailed Reports

MILL CR > WILLAMETTE R - AT MOUTH  
WILLAMETTE BASIN

Water Availability as of 6/26/2019

Watershed ID #: 30200701 ([Map](#))

Exceedance Level:

Date: 6/26/2019

Time: 4:09 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	236.00	69.90	166.00	0.00	0.00	166.00
FEB	224.00	67.80	156.00	0.00	0.00	156.00
MAR	206.00	67.60	138.00	0.00	0.00	138.00
APR	155.00	67.50	87.50	0.00	0.00	87.50
MAY	78.30	67.90	10.40	0.00	0.00	10.40
JUN	40.70	66.10	-25.40	0.00	0.00	-25.40
JUL	20.60	64.80	-44.20	0.00	0.00	-44.20
AUG	16.30	70.00	-53.70	0.00	0.00	-53.70
SEP	17.20	69.00	-51.80	0.00	0.00	-51.80
OCT	20.30	66.90	-46.60	0.00	0.00	-46.60
NOV	59.30	67.00	-7.72	0.00	0.00	-7.72
DEC	167.00	69.00	98.00	0.00	0.00	98.00
ANN	135,000.00	49,100.00	96,200.00	0.00	0.00	96,200.00