

WATER RESOURCES DEPARTMENT

MEMO

July 28, 2016

TO: Application ~~8-~~ LL1654

FROM: GW: M. Thoma
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ YES

☒ NO

The source of appropriation is within or above a Scenic Waterway

☐ 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 _____ 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 July 28, 2016

FROM: Groundwater Section Michael J Thoma
Reviewer's Name

SUBJECT: Application LL- 1654 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: Steve and Stacey Riemer County: Linn

A1. Applicant(s) seek(s) 0.33 cfs from 4 well(s) in the Willamette Basin,
South Santiam subbasin

A2. Proposed use Establishment of Hazelnuts Seasonality: March1 – October 31 (244 d)

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	Bedrock	0.33	11S/01W-32 NWSE	1600'N, 25' S of S ¼ cor S32
2	Proposed	2	Bedrock	0.33	11S/01W-32 NWSE	1200'N, 800' S of S ¼ cor S32
3	Proposed	3	Bedrock	0.33	11S/01W-32 NWSE	1200'N, 1000' S of S ¼ cor S32
4	Proposed	4	Bedrock	0.33	11S/01W-32 NESE	1200'N, 2000' S of S ¼ cor S32
5						

* 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	365	100-150	40-50		100-300	0-18	0-18					
2	365	100-150	40-50		100-300	0-18	0-18					
3	365	100-150	40-50		100-300	0-18	0-18					
4	365	100-150	40-50		100-300	0-18	0-18					

Use data from application for proposed wells.

A4. **Comments:** The applicant's wells are proposed with little specific information given on the construction. The reviewer assumes minimum case and seal depth and a range of completed depth based on other wells in the section. *First Water* and *SWL* are estimated based on well logs from nearby wells LINN 58788, 56866, 50397, and 6088.

A5. ☒ **Provisions of the** Willamette (OAR 690-505) 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: _____

A6. ☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.

Name of administrative area: _____

Comments: _____

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) _____;
 - 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 the _____ Competent Bedrock*
groundwater reservoir between approximately 50 ft. and 1000 ft. below
land surface;
- *The well(s) shall be cased and sealed into competent bedrock (e.g., sandstone, claystone, basalt)**
- 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:** There are no OWRD Observation Well data in the area of the proposed POAs so groundwater over-appropriation could not be determined. There are also no groundwater POAs within 1 mile of the proposed wells and very few in the area so interference and injury of existing groundwater rights is unlikely. Well yields reported on driller's logs for the area are typically between 5 and 40 gpm so it is likely that > 1 well will be needed to produce the 150 gpm requested by the applicant.

The geology of the area is made up of a layer of older terrace alluvial overlying Miocene volcanic-origin bedrock (Little Butte Volcanics) with younger alluvial material deposited within current/recent stream channels. To avoid potential injury to domestic wells that may be producing from the shallow alluvial material, the permit shall be conditioned to require continuous case and seal into the Miocene bedrock aquifer.

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	Bedrock of Little Butte Volcanics	☒	☐
2	Bedrock of Little Butte Volcanics	☒	☐
3	Bedrock of Little Butte Volcanics	☒	☐
4	Bedrock of Little Butte Volcanics	☒	☐
		☐	☐

Basis for aquifer confinement evaluation: Well logs for nearby wells report SWLs several feet above 'first water'

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	South Santiam R	320	~300	11,100	☒	☐	☐	☐	☒
2	1	South Santiam R	320	~300	11,900	☒	☐	☐	☐	☒
3	1	South Santiam R	320	~300	12,000	☒	☐	☐	☐	☒
4	1	South Santiam R	320	~300	13,000	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: GW elevation is above SW elevation which suggests that groundwater is flowing toward and discharging to surface water

Water Availability Basin the well(s) are located within: S Santiam > Santiam R – At Mouth (ID# 30200601)

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?
		☐	☐			☐		☐		☐

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:

- 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
1-4	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS				0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33		
Interference CFS		See comments below											
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		3090	3360	3170	2950	2050	968	450	275	253	363	1450	3040
(C) = 1 % Nat. Q		30.9	33.6	31.7	29.5	20.5	9.69	4.50	2.75	2.53	3.63	14.50	30.40
(D) = (A) > (C)													
(E) = (A / B) x 100		< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %

(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:

Comments: Interference with the S. Santiam River was not calculated because the condition that the well(s) be cased and sealed into the bedrock aquifer violates the assumptions of widely-accepted stream-depletion models (e.g., Hunt 1999, 2003) by requiring a multiple-aquifer model. Furthermore, the requested rate of 0.33 cfs is < 1% of the 80%-exceedance flows in the S. Santiam River for all months so there is no possibility that the proposed use will have the Potential for Substantial Interference under OAR 690-009.

- 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:
- ☐ The permit should contain condition #(s) _____;
 - ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

- C6. **SW / GW Remarks and Conditions:** The applicant's proposed wells would be producing from an aquifer that has been found to be hydraulically connected to the S. Santiam River at a distance of > 1 mile. Per OAR 690-009 the proposed use was found not to have the Potential for Substantial Interference (PSI).

One Horse Slough was not evaluated as a pertinent surface water source because it is an intermittent stream that has no surface water PODs near or downstream from the applicant's proposed wells and does not likely flow for the majority of the irrigation season. Additionally, the condition that the wells be cased and sealed into competent bedrock will further limit the potential for impacts to One Horse Slough for the periods when it does have considerable flows.

References Used:

Gannet, M. W. and R. R. Caldwell. 1998. *Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington*. USGS Professional Paper 1424-A.

Hunt, B. 1999. *Unsteady Stream Depletion from Ground Water Pumping*. Journal of Hydrologic Engineering, Vol 8(1), pp 12-19

Hunt, B. 2003. *Unsteady Stream Depletion when Pumping from a Semiconfined Aquifer*. Journal of Hydrologic Engineering, Vol 8(1), pp 12-19

Woodward, D. G., M. W. Gannett, and J. J. Vaccaro. 1998. *Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington*. USGS Professional Paper 1424-B.

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

S SANTIAM R > SANTIAM R - AT MOUTH

WILLAMETTE BASIN

Water Availability as of 7/28/2016

Watershed ID #: 30200601 (Map)

Exceedance Level: 80%

Date: 7/28/2016

Time: 12:11 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	3,090.00	266.00	2,820.00	0.00	0.00	2,820.00
FEB	3,360.00	1,530.00	1,830.00	0.00	0.00	1,830.00
MAR	3,170.00	1,260.00	1,910.00	0.00	0.00	1,910.00
APR	2,950.00	1,050.00	1,900.00	0.00	0.00	1,900.00
MAY	2,050.00	711.00	1,340.00	0.00	0.00	1,340.00
JUN	968.00	182.00	786.00	0.00	0.00	786.00
JUL	450.00	204.00	246.00	0.00	0.00	246.00
AUG	275.00	189.00	86.00	0.00	0.00	86.00
SEP	253.00	159.00	94.10	0.00	0.00	94.10
OCT	363.00	138.00	225.00	0.00	0.00	225.00
NOV	1,450.00	140.00	1,310.00	0.00	0.00	1,310.00
DEC	3,040.00	143.00	2,900.00	0.00	0.00	2,900.00
ANN	2,330,000.00	355,000.00	1,980,000.00	0.00	0.00	1,980,000.00

Well Location Map

